

'68'

2.00

Australia
Singapore

A \$ 4.00
S \$ 8.00
Malaysia

New Zealand NZ \$ 4.00
Hong Kong H \$ 20.00
M \$ 8.00

MICRO JOURNAL

VOLUME 1 ISSUE 6 • Devoted to the 6800 User • August 1979
"Small Computers Doing Big Things."

SERVING THE 6800 USERS WORLDWIDE



PHOTO CREDIT: NASA



SYSTEMS - SOLUTIONS

If you have a problem that can be solved by a computer—we have a systems solution.

- Two central processors with maximum RAM capacities of 56K and 384 K bytes
- Three types of disk drives with capacities of 175K, 1.2M and 16M bytes
- Two dot matrix printers with 80 and 132 line capacity
- A Selectric typewriter interface and a daisy wheel printer

Match these to your exact need, add one or more of our intelligent terminals and put together a system from one source with guaranteed compatibility in both software and hardware.

Southwest Technical Products systems give you unmatched power, speed and versatility. They are packaged in custom designed woodgrain finished cabinets. Factory service and support on the entire system and local service is available in many cities.



SOUTHWEST TECHNICAL PRODUCTS CORPORATION
219 W. RHAPSODY
SAN ANTONIO, TEXAS 78216 (512) 344-0241

Box 2574
West Lafayette, IN 47906
(317) 463-2502

'68'

MICRO JOURNAL

Portions of the text of '68' Micro Journal set using the following:
6800/2, DMAF1 and CT-82
Southwest Technical Products Corp.
219 W. Rhapsody
San Antonio, TX 78216

Editor, Word Processor and Sort/Merge
Technical Systems Consultants, Inc.
Box 2574
W. LaFayette, IN 47906 *MINIFLEX & FLEX REG.™ Technical Systems Consultants, Inc.

Selectric I/O
World Wide Electronics, Inc.
130 Northwestern Blvd.
Nashua, NH 03060

Publisher/Editor
Don Williams Sr.

Executive Editor
Larry E. Williams

Assistant Editor — software
Mickey E. Ferguson

Assistant Editor — Hardware
Dennis Womack

Associate Editor — Southwest
Dr. Jack Bryant

Associate Editor — At Large
Dr. Chuck Adams

Associate Editor — Midwest
Howard Berenson

Contributing Editor
Dr. Jeffrey E. Brownstein

Subscriptions and Office Manager
Joyce Williams

Typography and Color Separations
Williams Company, Inc.
Chattanooga, TN 37421

Seastrunk	5	6809 ADAPTOR FOR 6800
Embry	7	DATA FILES
Puckett	10	TSC SORT-MERG (Review)
Hanon	12	SMITH BUG (Review)
Ferguson	13	PATCH DISK SAVE & LOAD
		TSC TAPE BASIC
Thomas	17	SWTPC BASIC TO FLEX™
	20	SHOWS—VISITS & THINGS
Jackson	21	JAPANESE REPORT
	26	LETTERS
Gass	26	BASIC RENUMBER (Patch)
Brownstein	28	SPHERE STILL HERE
		"Print Using" CSS Basic
Morrow	32	THOMAS VIDEO RAM
Bennett	34	SWTPC RESET (fix)
	33-36	NEW PRODUCTS
Thompson	36	SIMPLE MULTI-TASKING

Send All Correspondence To:

'68' Micro Journal
3018 Hamill Rd.
PO Box 849
Hixson, Tennessee 37343

— Phone —

Office: 615-870-1993
Plant: 615-892-7544

Copyright

'68' Micro Journal is published 12 times a year by '68' Micro Journal, 6131 Airways Blvd., Chattanooga, TN 37421. Second Class postage paid at Chattanooga, TN. Postmaster: Send Form 3579 to '68' Micro Journal, PO Box 849, Hixson, TN 37343.

Subscription Rates U.S.A.:

(Special Charter Rate)

Increasing 40% September, '79
See page 46

1 year	\$10.50
2 years	\$18.50
3 years	\$26.50

Lifetime \$125.00 (one-time payment) Twice rate shown above for Air Mail/First Class anywhere in the U.S.A.

—ITEMS SUBMITTED FOR PUBLICATION—

(Letters to the Editor for Publication) All 'letters to the Editor' should be substantiated by facts. Opinions should be indicated as such. All letters must be signed. We are interested in receiving letters that will benefit or alert our readers. Praise as well as gripes is always good subject matter. Your name may be withheld upon request. If you have had a good experience with a 6800 vendor please put it in a letter. If the experience was bad put that in a letter also. Remember, if you tell us who they are then it is only fair that your name 'not' be withheld. This means that all letters published, of a critical nature, cannot have a name withheld. We will attempt to publish 'verbatim' letters that are composed using 'good taste.' We reserve the right to define (for '68' Micro) what constitutes 'good taste.'

(Articles and items submitted for publication) Please, always include your full name, address, and telephone number. Date and number all sheets. TYPE them if you can, poorly handwritten copy is sometimes the difference between go, no-go. All items should be on 8X11 inch, white paper. Most all art work will be reproduced photographically, this includes all listings, diagrams and other non-text material. All typewritten copy should be done with a NEW RIBBON. All hand drawn art should be black on white paper. Please no hand written code items over 50 bytes. Neatly typed copy will be directly reproduced. Column width should be 3¼ inches.

(Advertising) Any Classified: Maximum 20 words. All single letters and/or numbers will be considered one (1) word. No Commercial or Business Type Classified advertising. Classified ads will be published in our standard format. Classified ads \$7.50 one time run, paid in advance.

Commercial and/or Business advertisers please write or phone for current rate sheet and publication lag time.

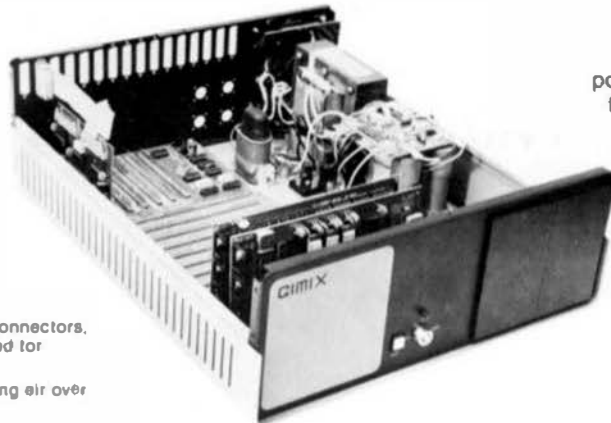


WANT A CLASSY CHASSIS?

See GHOST Ad page 43

SYSTEM 68 by GIMIX

The Ultimate in SS 50 BUS Reliability



- A.C. fuse holder
- Removable A.C. cord
- Exhaust fan
- Punched for 16 D type data connectors, 4 video connectors and aloited for ribbon cables.
- Ventilation slots, direct cooling air over boards first.

Mainframe: includes chassis power supply switches, fan and mother board **\$748.19**

16K Systems from \$1294.29

Includes: Mainframe cabinet, mother board, power supply, fan, CPU, 16K static RAM, and choice of I/O card.

- Holds 2 5 1/4 disk drives (not included)
- GIMIX disk regulator cards (optional) mount on drives and wire to filter assembly board
- LED power indicator
- 3 position removable keyswitch (Off; Power On-Reset Off; Both On)
- Reset - can be locked out
- Optional filler plates (when no drives are used)

CABINET

Heavyweight aluminum painted inside and out in grey and black baked enamel finish. Size: 18" wide x 21" deep x 7" high.

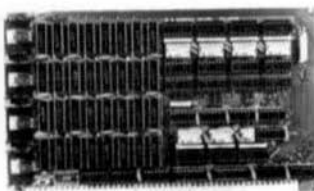
MOTHER BOARD

Hardware reconfigurable to give you the utmost versatility for use with various SS 50 bus software packages. Gold plated pins to insure long lasting electrical contact for protection against corrosion. Fifteen 50 pin slots plus eight DIP-switch addressable 30 pin I/O slots configurable to 4 or 8 decoded addresses. The fully buffered I/O block is addressable by DIP-switch to any 32 or 64 byte boundary and can also be disabled. UD1 and UD2 of the 50 pin bus can be strapped to UD3 and UD4 of the 30 pin bus. A fully shielded, (.090" thick), double sided P.C. board with noise reducing ground lines on the bottom side that separate all data, address, and signal lines, and a full ground plane on the top side. A 14 position clamping terminal block for all power and other external connections eliminates soldering, crimping or forming of wires.

POWER SUPPLY

Designed to power a fully loaded system plus two 5 1/4" disk drives and keep running at constant voltage outputs even under adverse A.C. power input conditions. It consists of: A 550 VA Ferro-resonant constant voltage transformer, over 15 pounds of brute force custom designed for GIMIX to GIMIX specs, an A.C. resonant capacitor, 3 D.C. filter capacitors, and GIMIX' unique filter assembly board that sits on top of the filter capacitors and includes individual fuses for each output, bleeder resistors, and a clamping terminal block for easy wiring connections. Almost a Quarter-farad of D.C. Filtering. Brown-out and over-voltage insurance. Supplies 8V at 25 Amps, + 15 Volts at 5 Amps and - 15 Volts at 5 Amps from A.C. input voltages ranging from 90 to 140 Volts.

SS 50 BUS 80 X 24 VIDEO BOARD



Deluxe Version **\$458.76**

Other Video Boards from \$198.71

16K Static RAM Boards for the SS-50 Bus \$298.13

- Gold bus connectors
- Individual Addressing, Write Protect, and Enable/Disable for each Block
- 4 separate 4K Blocks

As above with Sockets and Software control features **368.16**

All GIMIX memory boards are assembled, Burnt-In for 2 weeks, and tested at 2 MHz

8K PROM BOARD \$98.34

- Holds eight 2708 or 2708-compatible ROMS.
- DIP-switch addressable to any 8K boundary
- Gold Bus Connectors

2708s \$7.90 each

Add \$10. handling charge on orders under \$200.



With hardware scrolling, x-y addressable cursor and multiple character generators, it includes a TMS 2716 EPROM that contains a full 128 upper and lower case ASCII character set with true descenders; plus a socket for another TMS 2716 for an optional 128 character set; plus 2K of RAM for user defined programmable character sets. This gives the user the ability to create his own hieroglyphics, alphabet, graphic elements, etc., and store them on PROM, disk, or tape. The user can choose and intermix 384 different characters from any or all of the character generators and display up to 256 at one time, normally or inversely, and at full or half intensity, at any location on the screen. Continuous 8x10 character cells permit solid lines and connecting patterns with user definable graphic elements.

It is addressable to any 2K boundary. GHOSTable addressing allows multiple boards at the same address, making it ideal for multi-user applications. The available software includes a GIMIXBUG video based 3K ROM monitor, stand alone driver routines, and a program to create user defined characters.

Phone, write or see your dealer for complete brochure and price list.

GIMIX INC.

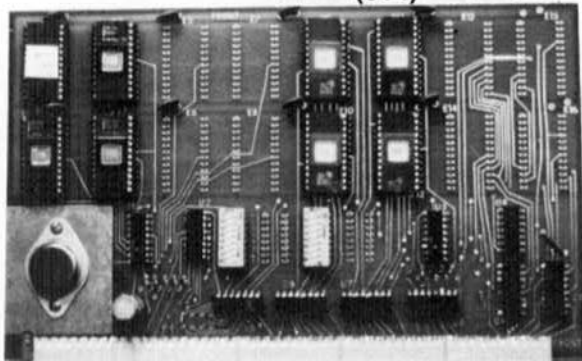
1337 WEST 37th PLACE
CHICAGO, ILLINOIS 60609
(312) 927-5510 • TWX 910-221-4055

The Company that delivers.
Quality Electronic products since 1975.

DIGITAL SERVICE & DESIGN

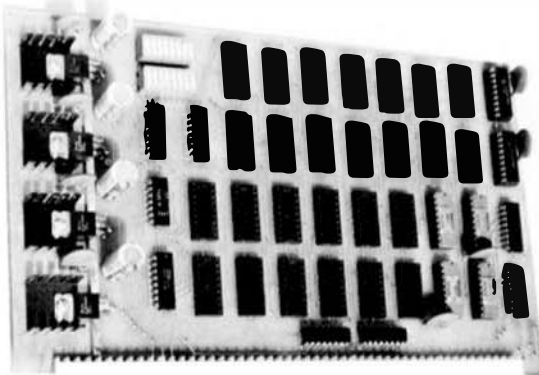


P.O. BOX 741
NEWARK, OHIO 43055
Phone (614) 366 6314



DSD P/R-32K\$27.00

32K or 16K EPROM & RAM memory card.
2716 2K x 8 or 2758 1K x 8 5V only EPROMS.
TMS 4016 2K x 8 or MK 4118 1K x 8 5V RAMS.
Up to 4 independent addressed 8K blocks. Dip
switch or jumper selected. Size 9" x 5 1/2"



DSD 2114-16K\$27.00

Full Static 16K Ram memory card designed to
use the 2114 or TMS 4045 1024 x 4 Static Ram.
The card has two independent addressed 8K
memory blocks. Card size 9" x 5 1/2". Power
requirements 7-8V unreg. @ 3.5A.

DSD U P 8255M\$14.00

Universal parallel interface card with wire wrap
area using INTEL'S 8255 parallel peripheral
interface chip. 24 programmable I/O lines.
(Three 8 bit Ports or Two 8 bit Ports with hand-
shaking) Card size 5 1/2" x 5" Standard SS-50 30
pin I/O BUS. 5V only.

Cards are bare with data and edge connector.
Ohio residents add 4 1/2% sales tax.

6847 Color Graphic card in design

"WHY CAN'T YOUR 6800 KEEP
TRACK OF THAT FOR YOU?"

NOW, IT CAN, I WITH

lookup - a data manager -

LOOKUP - A DATA MANAGER - IS A SIMPLE, EASY TO USE FILEING SYSTEM
FOR DATA OF ALL KINDS. A FEW MINUTES IS ALL THE LEARNING TIME
REQUIRED TO HAVE A POWERFUL INFORMATION RETRIEVAL TOOL AT YOUR
DISPOSAL. LOOKUP RUNS IN A MINIMUM FLEX SYSTEM - NO EXTRA MEMORY
TO BUY. LOOKUP'S FILE STRUCTURE ALLOWS STORED DATA TO BE ACCESSED
FROM BASIC OR AN EDITOR FOR COMPLEX MATHEMATICAL OR EDITING FUNCTIONS.
IT IS WRITTEN IN FAST ASSEMBLY LANGUAGE WITH SOURCE LISTINGS AND SOURCE
ON DISK.

LOOKUP COMES COMPLETE WITH 5 INCH MINIDISK AND REFERENCE MANUAL.
AN INDEX OF ALL 6800 RELATED ARTICLES IN THE MAJOR HOBBY MAGAZINES
IS PROVIDED FREE FOR INQUIRY FROM DISK. SUPPORT FOR FLEX VERSION 2.0
IS ALSO INCLUDED.

LOOKUP IS AVAILABLE FOR \$49.95 (POSTAGE PAID) FROM:

MYCROFTWARE SYSTEMS

P. O. BOX 1138

ST. CHARLES MISSOURI 63301

6800 DISK SOFTWARE

DISK SORT/MERGE. Up to 10 fields per record, string or
numeric, increasing or decreasing order. Available for dual
Flex* or Percom disk systems, but written in Basic so it can
be adapted to others. With source code on disk, instructions
\$35. With source code and instructions only, no disk, \$30.

BASIC UTILITY PACK. Simplifies documentation of Basic
programs, speeds them up too. Four programs renumber and
fix all references in GOTO, GOSUB, THEN, ON .. GOTO
and RESTORE statements, edit Basic source programs, allow
meaningful variable names, produce neat program listings,
provide an index of variables used, speed up execution and
cut down on memory usage of some programs. Supplied with
all source code on Flex* or Percom disk for \$30; limited
cassette version is \$20.

INTERRUPT DRIVEN TERMINAL DRIVER overlaps out-
put with computation, speeds up Basic or machine language
programs. With full source code, Cassette version \$20, Percom
disk version \$25.

CHECKBOOK BALANCER completely crosschecks check-
book against bank statement and cancelled checks, prepares
year-to-date output file for end of year summary. With full
source code in Basic on cassette \$20. Flex* or Percom disk
version at \$40 includes year-end income tax summary pro-
grams.

ALL ABOVE SOFTWARE includes full source code and
instructions, postage and handling. (Specify which DOS.)

Master Charge, VISA or C.O.D. orders accepted.

STAR-KITS

P.O. Box 209, Mt. Kisco, N.Y. 10549

*TM of TSC

6809 FOR THE 6800 (\$69.95)

Byron Seastrunk
%Percom 511 N. Kirby
Garland, TX 75042

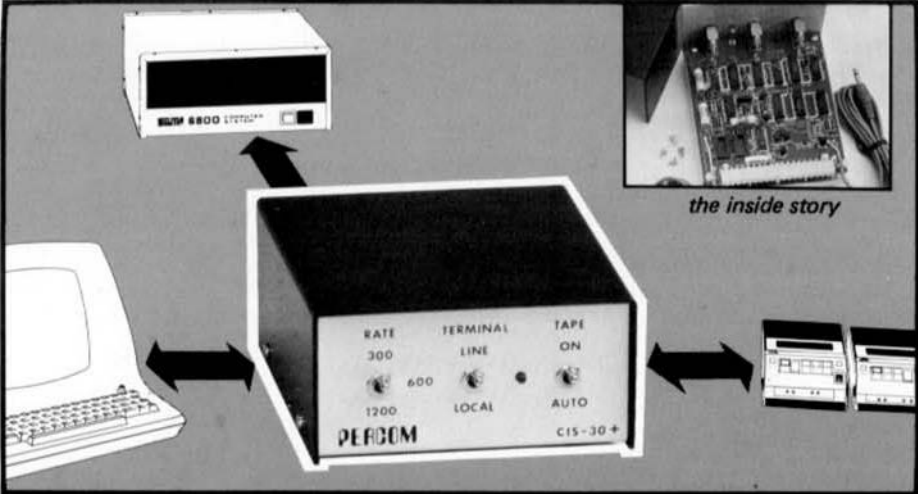
I kept agitating Harold (Harold Mauch of Percom Data) to give me one of his 6809 chips. He always put me off by saying 6809 chips were in short supply and besides I had not finished the INDEX driver software for the Smoke Signal Disk Controller. One day in a fit of dark humor, Harold gave me a "non-working" 6809 which Motorola had supplied for photographic purposes.

Curiosity finally got the best of me so I talked Mike (Mike Foreman, Percom's 6809 project engineer) into plugging my 6809 into his development system. EXPERIMENTERS REVENGE! The thing worked! To this day I have not found out what was supposed to be wrong with the chip (except that I can't get it to run at 2 mhz!).

Although I am sure Harold had seconds thoughts, he let me keep the chip. This was on a Friday afternoon. To avoid the verbal harassment I was sure to get if I didn't do something with the 6809, I began to think of the easiest way to get it running.

Percom's 6809 circuit cards were as scarce as No-Lead gasoline at 49.9. Besides I knew I shouldn't press my luck. I thought about wire-wrapping an entire CPU board but that would take at least a week spare time; everyday of which would mean enduring additional disparaging remarks from my colleagues. Besides it was a weekend and I couldn't find an SS-50 proto board anywhere.

After studying the schematic of my MP-A2 processor card I decided the easiest approach would be to mount the 6809 on a piece of perf-board (Radio Shack was still open) together with a 4 mhz crystal, a couple of TTL gates, and a 40-pin wire-wrap socket which would plug



- Record and playback at 120, 60 or 30 self-clocking bytes per second (extended Kansas City Standard)
- 1200, 600 or 300 baud data terminal interface
- Dual cassette operation
- Compatible with SWTPC cassette software
- Optional kit permits program control of cassettes
- Optional adaptor permits interfacing with any computer


Upgrade your SWTPC 6800 system to 1200 baud with PerCom's CIS-30+ dual-cassette/terminal interface

The CIS-30+ . . . four times as fast as SWTPC's AC-30 with the same dual-cassette capability . . . **plus** a 1200-baud data terminal interface . . . in a SWTPC color-compatible package that's only **1/10** the size of the AC-30.

Dependable? The simplicity of Harold Mauch PerCom Data designs says more than any well-chosen words. Simply put, for only **\$79.95*** you get the fastest, most dependable dual function interface you can buy for your SWTPC 6800.

To order or request literature call Percom toll-free 1-800-527-1592.

PerCom 'peripherals for personal computing'



PERCOM DATA COMPANY, INC.
DEPT. 68
211 N. KIRBY • GARLAND, TX 75042
(214) 272-3421

*Kit price. Assembled and tested:
\$99.95 + shipping. Tex. res. add
5% tax. BAC & MC available.

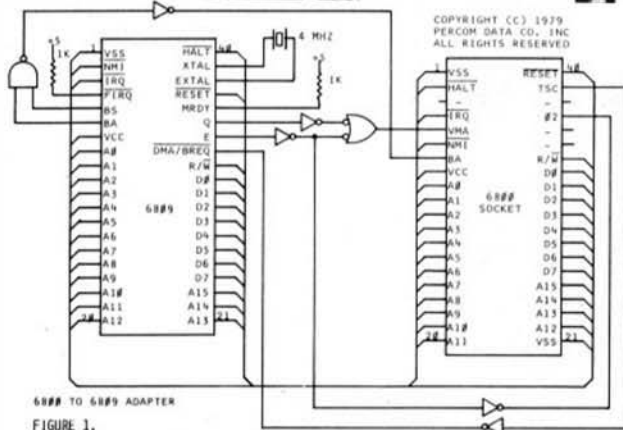
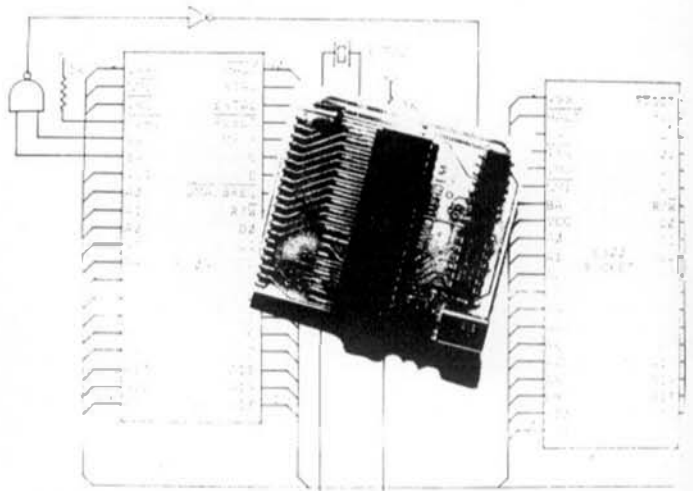
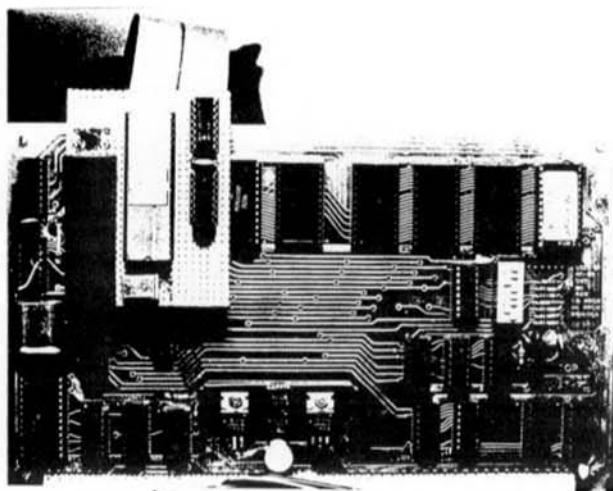
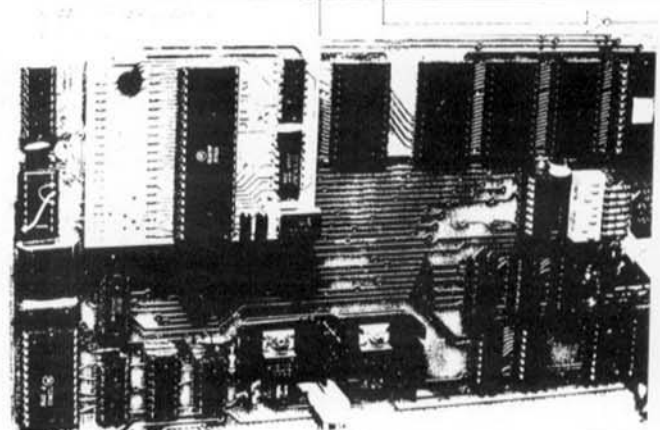


FIGURE 1.



into the 6800 socket. To get the 6809 clock and reset out to the bus I removed the 6875 clock generator from its socket and replaced it with a 16-pin DIP header which jumpered pin 7 to pin 13 and pin 12 to pin 14. You can get the rest of the details from the attached schematic and photograph.

I'm not sure it's worth the effort to modify the older MP-A processor card because there is no easy way to install a different PROM for the operating system.

Obviously the SMARTBUG monitor I used with the 6800 would not work with the 6809. So I burned a PROM with a short 6809 program which did nothing but print a string of "AAAAA..." on the terminal. It worked perfectly the first time I applied power.

Now a 6809 which does nothing but print "AAAAA..." may not seem like the pinnacle of software development but I was so excited I grabbed the wrong end of the soldering iron and earned a one week title of "Rightie"! I played with several more simple programs but decided to wait until Monday morning to get a copy of Percom's 6809 monitor.

Monday morning I displayed my cleverness to the other engineers and technicians at Percom. Now you have to understand that Harold gets a bit more excited than most normal people. When he saw my adapter he began to sputter something about torpedos and SWTP and how fast could I get the PCB layed out.

This weekend I'm laying out the PC board (as well as working on the Smoke driver for INDEX - Is there no justice?). Percom plans to make available a version of their 6809 system monitor (PSYMON) on a 2716 which will work with this adapter for \$69.95. You can also get the source and object of the monitor on diskette (Percom format) for \$29.95 and burn your own PROM. A kit of parts including the 6809, crystal, and PCB will be available from Percom or a Percom dealer in August for \$69.95.

Gene Embry
Rt. 1, Box 151 B-1-A
Morrisville, NC 27560

The storage of a large number of records on a Mail List data file, almost requires the use of fairly short string lengths. I say "almost" because one might use some concatenation techniques to put all the items of a mail list into a single string using de-limiters. FORGET IT!

One use of a Mail List is to send a letter to all or part of the people on it. Letters generally require string lengths much greater than the string lengths used during the manipulation of the mail list file. We need away to deal with this.

Using Computerware's Basic, how do we send all people on our mail list a letter that was written using a string value set equal to B2.

Our first attempt was to LOAD in a program (string=24) which printed the address information then CHAIN in another program (string=B2) which fetched and printed the letter. Finally, we CHAINED back the original program to print the complementary close, etc, etc. This did work but had at least one major drawback. SLOWNESS! When several hundred letters need to be sent we just didn't have time to wait.

The two programs presented in this article solved the problem. Their names are POKE.GEN and GENERAL.PRT.

The first, POKE.GEN with STRING=B2 gets the letter from disk and pokes it into RAM byte by byte. A small printer driver routine is also included.

GENERAL.PRT with STRING=24 access the Mail List data file, prints the inside address, calls the machine program to print the letter and finally prints the closing.

When POKE.GEN is called a couple of assumptions are made. First, that SSB DOS and Computerware Basic (Ver. 7.0 or 8.0) are being used. Second, a printer is on port 2 and is driven via an ACIA.

PROGRAM DETAILS

Lines #10-18 finds the current end of memory that Basic takes (\$6800) and changes it to \$5800. This reserves 4K of memory to be used for the driver program and the letter. Line #18 will take care of the re-allocation of memory via RUN.

Lines #30 to 99 sets the STRING=B2.

Lines #100 - 199 poke into RAM a program starting at location \$5800. This program is the USER called by GENERAL.PRT. If you have never dis-assembled a program written in decimal - now is your chance!

Lines #200 - 299 permits selection of the desired letter previously written and saved.

Lines #300 - 399 DLM is used in version 8.0 and upward to allow use of commas. Remove if using version 7.0

Lines #1000 - 1090 This routine is the major section of this program. Each line of the file is called up and then character-by-character is converted into its decimal equivalent via (line 1042) and poked into the next memory location.

Lines #3000 - 3090 add a Carriage Return and Line Feed. The end of the letter is signified by adding a control Z (\$1A). Don't forget to add it or you will be printing a long, long time.

At this point we have poked into RAM the printer driver routine and the letter. The program GENERAL.PRT is now CHAINED.

GENERAL PRINT uses strings of length 24 which was the number we used to store the data on our Mail List. Several mail lists are in use and each has a satellite file called SWAP.DAT that goes with it. The items stored here have to do with the number of records used, has it been sorted by ZIP code plus some other things not important here.

After setting a few variables we tell Basic where our USER program will start (lines 40-48).

The format of our mail list record is as follows:

A\$ = Name
B\$ = #1 Address
C\$ = #2 Address
D\$ = City and State
A = ZIP Code
E\$ = Salutation
B = Category

The Category is used during the building of the mail list to indicate the profession of A\$, i.e., 69 is all MD's that are left-handed with red hair and drive a 1955 Fairlane Ford. (Very few!!)

we are planning to change the Salutation field from a string to a numeric in order to get about 15% more names on each disk.

The subroutine called in line #130 is pretty much self-commented. In addition to sending the letter to everyone we may select only by ZIP code or by CATEGORY but not both. It would be desirable to be able to send a letter to only those of category = E9 who are in between ZIP codes 12345 and 23456. We just haven't been able to figure out the code! Maybe some smart '68 Journal Reader can help us out.

After selecting the people to get the letter we loop through the three routines called by lines #200 - 299. Here we make calls to the following three sub-routines.

1. TO: lines #3000 - #3090
2. MESSAGE: lines #2000 - 20900
3. FROM: lines #1000 - 1090

After all letters are printed we remember to restore the 4k of RAM we took from BASIC way back in the beginning.

One problem you might look for if you elect to run these programs is as follows. The ACIA driver program takes 32 bytes. If your letter and driver program along with the LF/CR are greater than 4k you will overwrite the DOS. Since our letters are very short, this has not been a problem for us.

I am currently running a variable speed SWTPC MP-2A with dual 8" 55B disks. DOS6B.42 with RAM from \$0000 to \$7FFF and from \$A000 to \$AFFF, a highly modified CT-1024, AC-30 and a DEC LA-34 completes our system.

```
0001 : POKE.GEN
0002 :
0003 : VERSION 3
0004 :
0005 : GENE EMBRY 7/10/79
0006 :
0008 : THIS IS TRICKY!
0009 :
0010 LET A=26B::COMPUTERWARE VER. 7.0 & 8.0
0012 LET B=PEEK(A)
0014 IF B=8B THEN 30:: THIS IS $5B
0016 IF B<>104 THEN A=A+1:GOTO 12::104 = $6B
0018 IF B=104 THEN B=8B:POKE(A,B):RUN
0030 STRING= B2
0032 HOME
0034 LINE= 0
0099 :
0100 : POKE MACHINE PGM. INTO RAM
```

```
0101 .
0110 LET A=22528::START OF RESERVED SPACE = $5B00
0122 READ B
0130 IF B<0 THEN 200
0140 POKE( A,B)
0145 LET A=A+1
0150 GOTO 122
0150 DATA 206,89,42,134,32,198,12
0162 DATA 141,20,90,93,38,250
0164 DATA 166,0,129,25,39,9
0166 DATA 141,8,8,129,10,39,233,32,241,57
0168 DATA 55,246,128,8,87,87,36,249,183,128,9
0170 DATA 51,57
0172 DATA -1
0199 :
0200 : WHICH LETTER TO SEND
0201 :
0210 INPUT "WHAT IS NAME OF LETTER TO PRINT ",A$
0220 INPUT "WHICH DISK CONTAINS THE LETTER ",N
0230 LET N$=STR$(N)
0240 LET A$=N$+CHR$(5B)+A$
0250 IF FCNK A$=0 THEN 300::IT EXISTS
0260 PRINT A$;" LETTER HASN'T BEEN WRITTEN."
0270 INPUT "WANT TO CONTINUE (Y/N) ",B$
0272 IF B$<>"Y" THEN END
0274 HOME
0280 GOTO 200
0299 :
0300 : GET IT
0301 :
0310 DLM=OFF ::PERMITS USE OF COMMAS - VER. 8.0 AND UP
0320 OPEN #1,A$
0330 GOSUB 1000::STICK IT
0340 DLM=ON
0350 CLOSE #1
0399 :
0900 :
0990 END ::CHAIN GENERAL.PRT
0999 :
1000 : HAVE A FEW GOOD POKES
1001 :
1003 HOME
1005 PRINT "THE LETTER WE ARE ABOUT TO SEND."
1009 :
1010 : REMEMBER 'A' STILL POINTS TO THE NEXT AVAILABLE LOC
1011 :
1020 READ #1,C$
1022 IF STATUS #1=6 THEN 1080
1038 PRINT C$
1040 FOR X=1 TO LEN(C$)
1042 LET D$=MID$(C$,X,1):D=ASC(D$)
1044 POKE( A,D):A=A+1
1046 NEXT X
1050 GOSUB 3000::CRLF
1060 GOTO 1020
1080 POKE( A,26)::END OF LETTER = $1A =CTRL Z
1090 RETURN
1099 :
2999 :
```

```

3000 : ADD CR & LF
3001 :
3010 POKE( A,13)
3020 POKE( A+1,10)
3030 LET A=A+2
3090 RETURN
3099 :

0001 : GENERL.PRT
0002 :
0003 : GENE EMBRY 6/30/79
0004 :
0010 STRING= 24
0012 LET T=2:LINE=0:HOME
0014 PRINT "THIS PRINTS A LETTER."
0015 DLM=OFF :INPUT"Today's DATE ",G$:DLM=ON
0016 INPUT "INSERT PROPER MAIL LIST IN DRIVE #9 AND PRESS
'RETURN' ",G$
0020 OPEN #1,1:SWAP.DAT
0022 READ #1,N1,N2,N3,N4,N5,N6,N7,N8,N9,J$,K$,L$
0024 CLOSE #1
0030 OPEN #10,1:MAIL.DAT
0039 :
0040 : SET UP LOCATION $28 AND $29 FOR THE MACHINE PGM.
0041 :
0042 LET Y=40:X=88:$58 = 88
0044 POKE( Y,X)
0046 LET X=0
0048 POKE( Y+1,X):: $0 = 0 (RIGHT ?)
0050 LET J$="GENE EMBRY"
0052 LET K$=" , ESQ."
0054 LET L$="ROUTE 1 BOX 151 B-1-A"
0056 LET M$="MORRISVILLE, N.C. 27560"
0058 LET V$="VERY TRULY YOURS,"
0070 PRINT "DON'T FORGET TO SET THE 'TAB' ON THE PRINTER (
17 SPACES). "
0080 INPUT "WHEN PRINTER IS READY PRESS 'RETURN' ",G$
0099 :
0100 : WHO SHALL GET THIS MESSAGE
0101 :
0105 HOME
0110 PRINT "THERE ARE "N3:"PEOPLE ON THE MAIL LIST."
0112 PRINT
0120 PRINT "YOU CAN ELECT TO:"
0130 GDSUB 4000::SELECTION CHART
0140 IF F<1 THEN 300
0199 :
0200 : MAIN
0201 :
0205 PRINT "WORKING IN RECORD # ":
0210 FOR X=1 TO N3
0212 PRINT X:
0214 SET RECNO#10=X:GOSUB 9000
0220 IF A$="" THEN 280::NO ONE IN SLOT
0222 IF F=1 THEN 270::EVERYONE GETS IT
0230 IF F=3 THEN 240
0232 IF F=2 IF A<A1 THEN 280
0234 IF F=2 IF A>A2 THEN 280
0236 GOTO 270::THEY GET A LETTER

0240 IF F=3 IF B<A1 THEN 280
0242 IF F=3 IF B>A2 THEN 280
0246 : THEY GET LETTER
0270 GOSUB 3000::TO:
0274 GOSUB 2000::MESSAGE
0276 GOSUB 1000::FROM:
0278 SKIP #T,5::GET READ FOR NEXT MESSAGE
0280 NEXT X
0299 :
0300 : RESTORE BASIC
0301 :
0305 GOTO 990
0310 CLOSE #10
0312 LET A=258
0320 LET B=PEEK(A)
0330 IF B<88 THEN A=A+1:GOTO 320
0340 IF B=88 THEN B=104:POKE(A,B)
0900 :
0990 END
0999 :
1000 : FROM
1001 :
1010 LET W=48
1012 PRINT #T:PRINT #T
1014 PRINT #T,TAB(W);V$
1016 SKIP #T,4
1020 PRINT #T,TAB(W);J$;K$
1030 PRINT #T,TAB(W);L$
1040 PRINT #T,TAB(W);M$
1050 SKIP #T,4
1090 RETURN
1099 :
2000 : PRINT MESSAGE
2001 :
2010 LET Z=USER(4)
2090 RETURN
2099 :
3000 : TO WHOM
3001 :
3003 PRINT #T
3005 PRINT #T,TAB(48);G$::DATE
3010 PRINT #T
3020 LET W=12
3030 PRINT #T,TAB(W);A$
3040 PRINT #T,TAB(W);B$
3050 IF C$="0" THEN 3070
3052 IF C$="0" THEN 3070
3054 IF C$="" THEN 3070
3060 PRINT #T,TAB(W);C$
3070 PRINT #T,TAB(W);D$;" "A
3072 SKIP #T,2
3074 PRINT #T,TAB(W);E$
3075 SKIP #T,2
3080 : PRINT #T,CHR$(12)::FOR PRINTERS HAVING 'TOF'
3082 : IF NO TOF THEN MUST COUNT LINES
3084 :
3090 RETURN
3099 :
4000 : MAKE UP SELECTION CHART
4001 :

```



```

4010 PRINT "1. SEND LETTER TO EVERYONE"
4012 PRINT "2. SEND TO THOSE HAVING CERTAIN 'ZIP' CODES"
4014 PRINT "3. SEND TO THOSE OF CERTAIN CATEGORIES"
4016 PRINT
4020 INPUT "MAKE SELECTION ",F
4022 IF F<1 P."BYE!";GOTO 4090
4030 IF F>3 P."BYE!";GOTO 4090
4040 IF F=1 THEN 4090
4050 IF F=2 THEN 4060
4052 INPUT "MINIMUM ZIP TO GET LETTER ",A1
4054 INPUT "MAXIMUM ZIP TO GET LETTER ",A2
4056 IF A2<A1 THEN 4052
4058 GOTO 4090
4060 INPUT "MINIMUM CATEGORY TO GET LETTER ",A1
4062 INPUT "MAXIMUM CATEGORY TO GET LETTER ",A2
4064 IF A2<A1 THEN 4060
4090 RETURN
4098 :
9000 : GET
9001 :
9010 GET #10,A$,B$,C$,D$,A$,E$,B
9090 RETURN
9098 :

```

TSC SORT-MERGE (Review)

Dale Puckett
14753 Endsley Turn
Woodbridge, VA 22193

One of the most useful software packages available for 6800 users is the Technical systems Consultants (TSC) Sort/Merge package. It is a highly recommended addition to your business system.

When Don Williams asked me if I would like to review it, I jumped at the opportunity. I had been curious about its capabilities since the small advertisements announcing its availability did not go into great detail.

If you were an advertising writer and had to come up with a campaign to sell the package to the general public, you could rightly borrow the famous, "Have It Your Way." from the hamburger chain. The Sort/Merge package will do just about everything you could want. Once again, TSC hasn't missed a trick. This article will attempt to acquaint the reader with the package and show how easy it is to use.

HARDWARE REQUIREMENTS. The package requires that the user have a disk system with the FLEX operating system and a minimum of 8K user memory starting at \$0000. All input to the program comes from disk files. Output may be routed to another disk file, the terminal or a printer.

DOCUMENTATION. It's outstanding. The manual states in the introduction that it was written with a non-computerist in mind. I agree and would go as far as to say that your secretary will be able to use the system after reading the tutorial in the manual and practicing with the sample data files supplied on the system disk. Inside a week she should be able to make it spit out a list sorted to any degree of precision, in any format, that you can dream up.

OVERVIEW. There are five command files, one system file and two sample data files on the disk supplied by TSC. SORT.CMD and MERGE.CMD prompt the user for all parameters needed by the system. PSORT.CMD AND PMERGE.CMD (the P stands for Parameter) both get their sort parameters off of a file which is created by SORT.CMD or MERGE.CMD. This really comes in handy when you want to sort a number of files over a period of time, once a month for instance. Using PSORT or PMERGE you only have to enter the parameters once.

CSORT.CMD is a command line sort which allows you to enter the parameters on one line without prompting. This will appeal to people who understand the way the system works and enjoy feeling that they control their own destiny. SRTMRG.SYS is the actual Sort/Merge system file. It is called automatically by the command files after all parameters are set up.

Finally, the sample data files are simply two lists of 10 names and phone numbers. The first file has only one field per record and is set up by column position. The second is set up with three fields per record; one each for last name, first name and phone number. The manual gives complete examples for working with both types of files.

OPERATION. The best way to show how easy it is to use the package is to go through the set up procedure step by step. You'll soon discover that you don't need to know very much about sorting to use the package.

You start by typing SORT NAMOFIL. The default extension is .TXT. Each time the Sort or Merge command prompts for a parameter it gives you a list of the options. You'll notice that one of the options has an asterisk "*" beside it. This option is the default and can be selected by simply typing a carriage return. The package is so well planned

that you will find yourself hitting the carriage return key most of the time.

After typing a banner on the terminal, the system asks the operator, "OUTPUT TO DISK (Y OR N*)?" If you want a sorted file on the disk, just type, "Y." If not, type "N" or hit return.

The system then asks, "INTERMEDIATE WORK FILE DRIVE?" You may type a drive number here, or hit return and let it default to the FLEX system drive.

"FIXED OR VARIABLE LENGTH RECORDS (F OR V*)?" is the next prompt. You'll find that most of the files you will need to sort are variable so the default option will most likely be your choice.

Other prompts ask you for an End of Record (EOR) character (the default is a carriage return or \$OD); a field separator character; and if the output should come from the key, the input file, or some other source (the default is the input file).

After this preliminary questioning, the system prompts the operator for the input keys. This step is the key to the sort.

The SRTMRG.SYS uses the keys you specify here to sort the file. To simplify the concept lets assume that you have a file on your disk which contains a mailing list for your church newsletter. To qualify for a cheaper mail rate you may desire to supply the mailings to the post office already sorted by zip code.

Let's assume that your file has the following fields, each separated by a comma or other field separator character: LAST, FIRST, INITIAL, TITLE, STREET, CITY, STATE, ZIP, PHONE.

Because of the way you have organized your file, the zip code is in the eighth field. You must give this information to the Sort/Merge package along with the starting and ending columns that you want to sort from within the field. Since you know the zip code is five characters long, you would simply type "(8)1-5" in response to the prompt.

If you wanted to sort by LAST name, you would type (1)1-10. If you wanted to sort first by LAST name, then by FIRST name, you would type (1)1-10,(2)1-10. You may use as many keys in a sort as you please.

To test the system, I quickly built a file containing names and addresses in the family telephone book and gave it a workout. I sorted the records in every combination I could think of and had them

output in every format I could dream up. I did not experience any difficulty and the response always came immediately after I hit the return key. Another user told me that he often sorted files with over 7,000 records and it only took the system two or three seconds to respond.

After you have entered the input keys you will receive a prompt which asks for the output keys. If you simply hit the return key the system will default to the entire record.

The output keys allow you to print the record in any format you prefer on the terminal, printer or even in a new disk file.

For example if you wanted to sort the file mentioned above and print out a list with the first name followed by the last name, you would simply type: (2)1-*, \$20,1-*, \$20,(9)1-*. The \$20 prints a space between the first and last names and between the last name and the phone number. Besides printing the character equal to a hexadecimal value, the system will also let you print a literal string on the screen. You do this by putting the string in single quotes like this: (2)1-*, \$20,1-*, \$20,'and his phone number: ',(9)1-*. You may also tab over to a column position by typing a commercial at sign followed by the column position desired.

It is an easy matter to tell the system to right or left justify different output keys, or to sort in either ascending or descending order.

After entering the output keys you will be asked if you desire to specify further options. Most of the time you won't need them, but if you type yes to this question you will be asked over a half-dozen additional questions. In the interest of keeping this article short, we'll let you be pleasantly surprised when you buy the package. Finally, you will be asked if you wish to save the parameter file on the disk. If you answer yes, there will be prompt for a file name. Then, the file will be saved. If you save this file, you will be able to do similar sorts on any file later using the PSORT.CMD. It sorta immediately and does not ask all the questions. At this point you will be asked if you want to go ahead and sort, or exit the system. Most of the time you will want to sort, so you will type an S. After you type it, you're screen will start to fill with neatly sorted data, almost instantaneously.

CONCLUSION. The TSC Sort/Merge package is one of the finest pieces of software available for the 6800 microprocessor to date. For \$75.00 you can do the same job performed by many of the so called data base management programs which run in BASIC. In fact, you can do more, do it faster, and with less memory overhead. This review has only touched the highlights. The package can do a lot more.

SMITHBUG (A Review)

David Hanon
Box 237C, Rt. 6
Ringgold, GA 30738

Not Just Your Average 6800 Bug
Recently I had been organizing some of my favorite utility routines and was preparing to expand the command table in SWATBUG (my present monitor) to accomodate them.

It was at that time that I was asked to evaluate the SMITHBUG monitor from Ed Smith's Software Works for 68 Micro Journal. After becoming acquainted with the features of SMITHBUG, my efforts to expand SWATBUG came to a sudden halt. SMITHBUG contained all of my proposed additions for SWATBUG plus many more sophisticated features.

SMITHBUG is supplied in either a SWATBUG or a SMARTBUG compatible version and requires a 6850 ACIA at \$8004 (SWATBUG version) or \$8008 (SMARTBUG version).

SMITHBUG resides at the top of memory (\$F800-\$FFFF) and can be operated in conjunction with SWATBUG or SMARTBUG, or it may be used as a stand alone monitor. Also you must have an EPROM board in your system which will accept 2716 EPROMS or the SWTP A-2 processor board can be used.

If SMITHBUG is to be used with SWATBUG for example, SWATBUG will need to be copied into another 2716 EPROM and addressed at it's usual \$E000 address. The reason for this is that full address decoding was not used for the monitor socket on the SWTP processor boards and SWATBUG is mirrored 8 places from \$E000 through \$FFFF and this would cause double addressing. When using SMITHBUG at \$F800 and SWATBUG at \$E000 on the A-2 processor board turn the HI-PROM switch off, the monitor switch off, and the 4K-8K switch on.

Now let's get to the super features that SMITHBUG provides. "R" Register dump displays the values of all the 6800 registers along with labels so you don't forget what order they are displayed in.

Also the processor status register is shown bit by bit with each bit labeled. "D" Disassemble program starting at a specified address. The disassembler converts a machine language program to standard mnemonic symbols. The object address for relative branches and indexed operations are displayed as well as a print out of all ASCII characters. The disassembler is advanced to the next instruction by pressing the space bar. "T" Trace will single step programs starting at a specified address for debugging. The space bar is used to advance to the next instruction and a register dump is displayed for each instruction. Also a disassembled listing is shown for each instruction which makes it easy to follow program flow. The trace function can be aborted at any time by pressing the return key.

Since Trace will only step through RAM, jumps to addresses above \$E000 are sensed and the single stepping will continue after program flow returns to the main program. "I" or "2" inserts one or two software interrupts at specified addresses. When an SWI is encountered a register dump will normally follow. However, provision has been made for the user to vector to a user written breakpoint routine. If an SWI is encountered while in the Trace mode the Trace mode may be re-entered by typing "k".

This covers the more complex features supported by SMITHBUG. The remainder of the features will only be discussed briefly.

SMITHBUG has a memory dump feature which will dump \$80 bytes on the CRT and interprets all ASCII characters on the line below the hex dump.

Also there is a block move routine, and similar to SWATBUG, a find (one hex byte) routine, a memory examine and change routine, a GOTO user program command, and a jump to user program.

Some other unique features of SMITHBUG include an insert command which will fill memory with a particular byte between specified addresses, a fill memory with ASCII characters from keyboard, command, and a terminal echo on/off command.

A jump to \$8020 is included to cold start the Smoke Signal Broadcasting BFD-68 disk system. I changed this jump to go to my SWATBUG disk boot. Also there is a jump to a disk operating system soft start entry point. I also changed this

jump to fit my particular disk operating system.

Another jump vector can be utilized to send all output to a hard copy device driver routine.

The only thing that is missing is a tape input/output routine, but if you have a disk system or if you use SMITHBUG in conjunction with another monitor which supports tape this is no problem.

I found it convenient to change the code in SMITHBUG to jump to SWATBUG with a "\$" which is the SWATBUG prompt. I also added to the command table in SWATBUG so that I could jump to SMITHBUG by typing "S" which is the SMITHBUG prompt. These changes are easy to make since the program resides in EPROM.

I have found SMITHBUG to be a complete and very useful monitor combining many of the utilities which I used to have to load separately when I needed them.

PATCH DISK SAVE & LOAD TSC TAPE BASIC

Mickey E. Ferguson
Box 708
Trenton, Ga 30752

IN CASE YOU HAVN'T TRIED IT, TSC'S NEW BASIC IS REALLY SUPER... IT IS ULTRA FAST, ACCURATE, AND FULL OF HELPFUL FEATURES. BUT MY PURPOSE IS NOT TO TELL YOU ALL ABOUT TSC'S BASIC. IT IS FOR THOSE OF YOU WHO (LIKE ME) COULDN'T WAIT FOR THE DISK VERSION, BUT WOULD RATHER SAVE & LOAD PROGRAMS TO & FROM DISK INSTEAD OF TAPE...

AFTER YOU HAVE ADDED THIS LITTLE PATCH TO TSC'S BASIC, AND YOU WANT TO SAVE A PROGRAM, YOU TYPE SAVE (JUST LIKE ALWAYS). YOU THEN BE ASKED FOR THE FILE NAME. THE DEFAULT EXTENSION IS .TXT AND THE DEFAULT DRIVE IS THE ONE THAT HAS BEEN ASSIGNED AS THE WORK DRIVE. IN BOTH CASES YOU MAY OVERRIDE THE DEFAULTS BY SPECIFYING YOUR DESIRES. THE PROCESS IS IDENTICAL FOR LOADING PROGRAMS, EXCEPT THAT YOU ENTER BY TYPING LOAD WHILE IN BASIC. THIS PATCH SHOULD WORK EQUALLY WELL WITH EITHER MINIFLEX OR WITH FLEX, AND THE DIFFERENCES ARE GIVEN IN THE SOURCE. YOU WILL ONLY NEED TO CHANGE THE EQUATES FOR THE SYSTEM YOU ARE USING.

WRITING THIS PATCH WAS AIDED BY THE METHOD TSC USED TO IMPLEMENT THE TAPE SAVE AND LOAD ROUTINES. FOUR SUBROUTINE CALLS ARE USED, THESE ARE: TINCH, TOUCH, TAPEON, AND TAPEOFF. THESE SUBROUTINE CALLS ARE INTENDED BY TSC TO BE USED AS FOLLOWS:

TINCH	READ A CHARACTER FROM TAPE
TOUCH	WRITE A CHARACTER TO TAPE
TAPEON	TURN TAPE ON
TAPEOFF	TURN TAPE OFF

HOWEVER, WE USE THE TINCH VECTOR TO CALL A ROUTINE TO READ A CHARACTER FROM DISK. AND THE TOUCH VECTOR IS USED TO WRITE A CHARACTER TO DISK. THE TAPEON VECTOR OPENS A FILE FOR READ OR WRITE. FINALLY, THE TAPEOFF VECTORS TO OUR CLOSE FILE SUBROUTINE.

ALL OF THE SUBROUTINES ARE EXPECTED BY BASIC TO PRESERVE THE CONTENTS OF THE B AND X REGISTERS. THIS IS TAKEN CARE OF BY THE SAVE AND RESTOR SUBROUTINES IN OUR PATCH. ERROR HANDLING IS PROVIDED THROUGH FLEX'S RTPERR SUBROUTINE AND ALL OPEN FILES ARE CLOSED SHOULD ANY ERROR OCCUR.

THE OPEN SUBROUTINE CALLS THE SAVE SUBROUTINE, ATTEMPTS TO FIND IF IT IS SUPPOSED TO BE SAVING OR LOADING, PROMPTS FOR THE FILE NAME, AND OPENS THE FILE. OPEN RETURNS TO BASIC THRU THE RESTOR SUBROUTINE. THE METHOD USED HERE TO DETERMINE WHERE THE CALL TO THE OPEN SUBROUTINE CAME FROM COULD PERHAPS BE USEFUL TO YOU IN OTHER PROGRAMS THAT YOU MAY WRITE. SO LETS LOOK AT IT IN A BIT OF DETAIL. YOU WILL NOTE THAT OPEN, AFTER PRESERVING THE X AND B REGISTERS, TRANSFERS THE STACK POINTER TO THE INDEX REGISTER. THIS POINTS THE INDEX REGISTER TO THE TOP OF THE STACK. THEN THE INDEX REGISTER IS LOADED, INDEXED. THIS PUTS THE ADDRESS ON THE TOP OF THE STACK INTO THE INDEX REGISTER. AS YOU ARE PROBABLY AWARE, WHEN A SUBROUTINE IS CALLED, THE 6800 PUSHES THE RETURN ADDRESS ONTO THE STACK. BY USING THE PROCEDURE JUST OUTLINED, THE RETURN ADDRESS IS PLACED IN THE INDEX REGISTER. IT DOES NOT DISTURB EITHER THE STACK OR THE STACK POINTER. IN TSC TAPE BASIC THERE ARE TWO CALLS TO THE TAPEON SUBROUTINE, THEY ARE LOCATED AT \$0719 IN BASIC'S SAVE ROUTINE AND AT \$07B2 IN BASIC'S LOAD ROUTINE. THE SUBROUTINE CALL AT \$0719 RESULTS IN \$071C (THE ADDRESS OF THE INSTRUCTION FOLLOWING THE SUBROUTINE CALL) BEING PUSHED ONTO THE STACK. LIKewise, THE CALL AT \$07B2 PUTS

ADDRESS \$07B5 ON THE STACK. IF THE OPEN ROUTINE FINDS \$071C ON THE TOP OF THE STACK, IT KNOWS THE CALL WAS FROM THE SAVE ROUTINE IN BASIC. AND FINDING \$07B5 ON THE STACK MEANS THE CALL WAS FROM BASIC'S LOAD ROUTINE. ANYTHING ELSE ON THE STACK AT THIS POINT IS AN ERROR CONDITION, AND THE PATCH SIMPLY RETURNS CONTROL TO THE WARM START ENTRY OF BASIC. IF AN ERROR CONDITION IS DETERMINED TO EXIST THEN NO ATTEMPT WILL BE MADE TO OPEN, READ, OR WRITE TO A DISK FILE.

THE CLOSE SUBROUTINE FIRST CALLS THE SAVE SUBROUTINE, THEN CHECKS TO SEE IF THE FILE IS OPEN OR NOT. IF THE FILE IS NOT OPEN, IT RETURNS TO BASIC THROUGH RESTOR. IF THE FILE IS OPEN, IT IS CLOSED AND CONTROL IS RETURNED TO BASIC THROUGH RESTOR.

THE READ SUBROUTINE READS A CHARACTER FROM THE FILE, THEN CHECKS TO SEE IF AN ERROR OCCURRED. IF NO ERROR CONDITION EXISTS, IT'S BACK TO BASIC THROUGH RESTOR. IF, HOWEVER, AN ERROR DID OCCUR; THE ERROR TYPE IS CHECKED TO SEE IF IS THE END OF THE FILE. WHEN AN END OF FILE ERROR IS FOUND, THE FILE IS CLOSED BEFORE RETURNING TO BASIC. IF THE ERROR WAS NOT AN END OF FILE, THEN READ CALLS THE ERROR ROUTINE TO REPORT THE ERROR.

THE WRITE SUBROUTINE WORKS MUCH LIKE THE READ SUBROUTINE EXCEPT THE CHARACTER IS WRITTEN TO THE DISK. AND ALL ERRORS ARE REPORTED.

IT SHOULD BE MENTIONED THAT THE FORMAT USED IN THE DISK FILE IS THE SAME USED BY TSC TAPE BASIC WHEN SAVING TO TAPE. THIS FORMAT IS NOT COMPATABLE WITH ANY OTHER BASIC (OR EDITOR) THAT I KNOW ABOUT. ONCE YOU HAVE ASSEMBLED THE PATCH, I WOULD SUGGEST YOU APPEND THE BINARY FILES BASIC AND THE PATCH TOGETHER. THUS CAUSING THE PATCH TO BE LOADED AUTOMATICALLY WHENEVER YOU RUN BASIC.

THIS PATCH IS ASSEMBLED FOR A BEGINNING ADDRESS OF \$C000 AND AS A RESULT YOU MAY NEED TO ASSEMBLE IT ELSEWHERE IN MEMORY. YOU COULD PUT IT AT \$6F00 (FOR EXAMPLE) AND SET BASIC'S END OF MEMORY INDICATOR (AT ADDRESSES \$40-\$41) TO \$6EFF. WITH A LITTLE MORE WORK, IT COULD BE MODIFIED TO WORK WITH OTHER DISK OPERATING SYSTEMS. AND COULD BE USED WITH JPC PRODUCTS CFM/3 CASSETTE OPERATING SYSTEM. WHETHER YOU ARE USING FLEX OR NOT, IT SHOULD NOT BE TOO DIFFICULT WITH YOUR OPERATING SYSTEM. SO WHY NOT TRY IT?

NAM TSC BASIC PATCH

```
*
* PATCH TO ALLOW TSC TAPE BASIC
* SAVE AND LOAD PROGRAMS TO DISK
* WITH THE FLEX DOS
*
* MICKEY E. FERGUSON, WA4KDC
*
* SYSTEM EQUATES
*
```

AD03	DOS	EQU	\$AD03	(IN MINIFLEX EQU \$7103)
AD1E	PSTRNG	EQU	\$AD1E	(IN MINIFLEX EQU \$7118)
AD1B	INBUFF	EQU	\$AD1B	(IN MINIFLEX EQU \$7115)
AD33	SETEXT	EQU	\$AD33	(IN MINIFLEX EQU \$712D)
AD2D	GETFIL	EQU	\$AD2D	(IN MINIFLEX EQU \$7127)
B403	FMSCLS	EQU	\$B403	(IN MINIFLEX EQU \$7803)
B406	FMS	EQU	\$B406	(IN MINIFLEX EQU \$7806)
AD3F	RPTERR	EQU	\$AD3F	(IN MINIFLEX EQU \$713C)
AD15	INEEE	EQU	\$AD15	(IN MINIFLEX EQU \$710F)
AD18	OUTEEE	EQU	\$AD18	(IN MINIFLEX EQU \$7112)
0103	WARMS	EQU	\$0103	BASIC'S WARM START ENTRY
0001	TXT	EQU	1	TEXT EXTENSION VALUE
0008	EOF	EQU	8	
0001	ROCOM	EQU	1	FMS OPEN FOR READ COMMAND
0002	WRCOM	EQU	2	FMS OPEN FOR WRITE COMMAND
0004	CLSCOM	EQU	4	FMS CLOSE FILE COMMAND

*

```

* SET EXIT TO RETURN TO FLEX
*
0106          ORG    $0106
0106 7E AD 03  JMP    DOS
*
0112          ORG    $112      SET VECTORS IN BASIC
0112 7E CO 5F  TINCH  JMP    READ
0115 7E CO 73  TOUCH  JMP    WRITE
0118 7E CO 00  TAPEON  JMP    OPEN
011B 7E CO 4A  TAPEOFF JMP    CLOSE
*
* YOU MAY WISH TO LOCK OUT BASIC'S END OF
* MEMORY (ADDRESSES $40+$41) AND
* ORG AT SOME LOCATION IN THE LOWER 32K
*
C000          ORG    $C000      OR WHEREVER HANDY
*
* OPEN FILE FOR READ OR WRITE
*
* DETERMINES IF SAVE OR LOAD (S OR L)
* AND ASKS FOR FILE NAME
* DEFAULT EXTENSION IS .TXT
*
C000 BD CO 84  OPEN    JSR    SAVE      PRESERVE X & B REG
C003 30          TSX      POINT TO TOP OF STACK
C004 EE 00      LDX      0,X          PUT ADDRESS FROM STACK IN X
C006 8C 07 1C   CPX      #$071C      IS IT A SAVE?
C009 26 05      BNE      OPEN1
C00B 86 02      LDA A    #WRCOM      FMS WRITE COMMAND
C00D 36          PSH A    SAVE COMMAND
C00E 20 08      BRA      OPEN2
C010 8C 07 B5   OPEN1  CPX      #$07B5  IS IT A LOAD?
C013 26 32      BNE      ERR1        SOMETHING WRONG BACK TO BASIC
C015 86 01      LDA A    #RDCOM      FMS READ COMMAND
C017 36          PSH A    SAVE COMMAND
C018 CE CO 88   OPEN2  LDX      #FILNAM GET FILENAME
C01B BD AD 1E   JSR      PSTRNG
C01E BD AD 1B   JSR      INBUFF
C021 CE CO 9A   LDX      #FCB        POINT TO FCB
C024 BD AD 2D   JSR      GETFIL      PUT FILENAME IN FCB
C027 25 16      BCS      ERROR
C029 86 01      LDA A    #TXT        SET DEFAULT .TXT EXTENSION
C02B BD AD 33   JSR      SETEXT
C02E CE CO 9A   LDX      #FCB        POINT TO FCB
C031 32          PUL A    GET OPEN FILE COMMAND
C032 A7 00      STA A    0,X          PUT COMMAND IN FCB
C034 BD B4 06   JSR      FMS        GO OPEN FILE
C037 26 06      BNE      ERRDR
C039 86 FF      LDA A    #$FF        NO SPACE COMPRESSION
C03B A7 3B      STA A    59,X
C03D 20 3E      BRA      RESTOR      RESTORE X & B REG
*
* UNIVERSAL ERROR ROUTINE
*
C03F BD AD 3F   ERROR  JSR      RPTERR  REPORT ERROR
C042 BD B4 03   JSR      FMSCLS      CLOSE ALL OPEN FILES
C045 80 36      BSR      RESTOR
C047 7E 01 03   ERR1   JMP      WARMS  RETURN TO BASIC
*

```



```

      * CLOSE FILE, IF OPEN
      *
C04A 80 38      CLOSE  BSR    SAVE
C04C CE C0 9A      LDX    #FCB    POINT TO FCB
C04F E6 02      LDA B  2,X    GET FILE STATUS
C051 27 2A      BEQ    RESTOR  IF CLOSED WE'RE DONE
C053 CE C0 9A      CLOSE0 LDX    #FCB    POINT TO FCB
C056 86 04      LOA A  #CLSCOM CLOSE FILE COMMAND
C058 A7 00      STA A  0,X
C05A 80 B4 06      JSR    FMS    GO CLOSE FILE
C050 20 1E      BRA    RESTOR

      *
      * READ A BYTE FROM FILE
      *
C05F 80 23      READ   BSR    SAVE
C061 CE C0 9A      LOX    #FCB    POINT TO FCB
C064 80 B4 06      JSR    FMS    GO READ A CHARACTER
C067 26 02      BNE    READ1  BRANCH IF ERROR
C069 20 12      BRA    RESTOR
C06B A6 01      READ1  LOA A  1,X    GET ERROR TYPE
C06D 81 08      CMP A  #EOF    END OF FILE?
C06F 27 E2      BEQ    CLOSE0  IF SO GO CLOSE FILE
C071 20 CC      BRA    ERROR    OTHERWISE REPORT ERROR

      *
      * WRITE A BYTE TO FILE
      *
C073 80 0F      WRITE  BSR    SAVE
C075 CE C0 9A      LDX    #FCB    POINT TO FCB
C078 BD B4 06      JSR    FMS    GO WRITE A CHARACTER
C07B 26 C2      BNE    ERROR    REPORT ANY ERRORS

      *
      * RESTORE X & B REGISTERS
      *
C07D FE C0 97      RESTOR LOX    XTEMP  RESTORE X REG
C080 F6 C0 99      LOA B  BTEMP  RESTORE B REG
C083 39      RTS    DONE

      *
      * PRESERVE X & B REGISTERS
      *
C084 FF C0 97      SAVE   STX    XTEMP  SAVE X REG
C087 F7 C0 99      STA B  BTEMP  SAVE B REG
C08A 39      RTS
C08B 46      FILNAM FCC    /FILE NAME? /
C08C 49 4C
C08E 45 20
C090 4E 41
C092 40 45
C094 3F 20
C096 04      FCB    4
C097      XTEMP  RMB    2
C099      BTEMP  RMB    1
C09A      FCB    EQU    *
      END

```

NO ERROR(S) DETECTED

SYMBOL TABLE:

BTEMP	C099	CLOSE	C04A	CLOSE0	C053	CLSCOM	0004	DOS	AD03
EOF	0008	ERR1	C047	ERROR	C03F	FCB	C09A	FILNAM	C08B

FMS	B406	FMSCLS	B403	GETFIL	A020	INBUFF	AD1B	INEEE	AD15
OPEN	C000	OPEN1	C010	OPEN2	C01B	OUTEEE	AD1B	PSTRNG	AD1E
RDCOM	0001	READ	C05F	READ1	C06B	RESTOR	C07D	RPTERR	AD3F
SAVE	COB4	SETEXT	AD33	TAPEOF	011B	TAPEON	011B	TINCH	0112
TOUCH	0115	TXT	0001	WARMS	0103	WRCOM	0002	WRITE	C073
XTEMP	C097								

SWTPC BASIC TO FLEX

Jim Thomas
Rt. 2 Box 78D
Manor, TX 78653

FLEX (TM) is a fairly powerful disk operating system and many of the commands are useful in handling data in a 6800 system. But have you ever wished you could use these DOS commands from BASIC? Well now you can. At least some of them.

This program adds a new command to SWTPC Basic which passes command lines to FLEX. The commands appear in a Basic program exactly as you would enter them in FLEX and any DOS command that does not alter the memory space used by Basic may be executed.

This feature may also be used to add "user" routines to Basic which are command files or to print special forms/headings from a disk file using the LIST command. Caution must be used since many FLEX commands use memory space which Basic uses and will wipe out Basic or its data when they are executed. Some that do this are EXEC, CAT and COPY. User written commands must reside in the DOS utility command space or some higher non-basic memory.

In interfacing this program several memory locations may change between versions of Basic. These are pretty obvious by inspecting the program. The idea is to use some space after Basic to implement the program and insert the command DC into the command table SKSP starts LDAA 0,X; CMPA #\$20 and BASBAK starts LDX #\$2344; STX 5D; CLR 0010 in my system. This should help you find them if they have moved a few locations in the various versions.

The patch is implemented by assembling the program and then APPENDING it to the end of Basic. This will waste a couple of sectors, but I prefer this method to SAVEing Basic with the patches installed.

```

      NAM      BASIC TO DOS INTERFACE COMMAND "DC"
      OPT      NOG
* * * * *
* JIM THOMAS - JULY 79 *
* * * * *
* THIS BASIC COMMAND PROVIDES A MEANS OF
* EXECUTING DOS COMMANDS DIRECTLY FROM

```

```

* BASIC.. BASIC FEEDS THE COMMAND TO THE
* DOS COMMAND BUFFER AND TURNS CONTROL OVER
* TO DOS.. WHEN THE COMMAND IS FINISHED,
* BASIC RESUMES CONTROL
*
* SYNTAX: (line#) DC (dos command line)
*   line # IS OPTIONAL (IMMEDIATE MODE)
*   DC is the BASIC COMMAND WORD (REQUIRED)
*   dos command line IS A COMMAND LINE TO
*       DOS EXACTLY AS IT WOULD BE
*       TYPED WHEN IN FLEX (AFTER +++)
*       (i.e. variables are not allowed)
*
*
* EXAMPLE: 0100 DC LIST TEST
* WILL LIST ON THE TERMINAL, THE FILE
* "TEST.TXT"
*
* NOTE: DOS COMMANDS THAT USE MEMORY FROM
* BASIC'S AREA WILL NOT WORK..
* SOME OF THESE ARE: EXEC, CAT, COPY ETC.
* SOME THAT WILL WORK ARE LIST,TTYSET
* DELETE,RENAME,APPEND,P, ETC.
* * * * *
*
* .... ON WITH THE PROGRAM
*

```

* BASIC ADDRESS LOCATIONS

02FD	TAPADD	EQU	\$2FD	TAPPEND ENTRY IN TABLE ##
014E	MEMST	EQU	\$14E	CONTAINS START OF DATA AREA
0F52	TAPEND	EQU	\$0F52	ADDR OF TAPPEND ROUTINE ##
0B8C	SKSP	EQU	\$0B8C	SKIP SPACES ##
1079	BASBAK	EQU	\$1079	RE-ENTER BASIC ##

```

* ## = ADDRESSES THAT MAY CHANGE WITH
*   DIFFERENT VERSIONS OF BASIC

```

* FLEX ADDRESS LOCATIONS

7000	DOSBUF	EQU	\$7000	DOS LINE BUFFER
707F	DBEND	EQU	\$707F	END OF DOS BUFF
7094	BUFPNT	EQU	\$7094	BUFFER POINTER
7118	PSTRNG	EQU	\$7118	PRINT STRING
7142	DOCMND	EQU	\$7142	EXECUTE DOS AS SUB
* MAKE ROOM FOR THE DC ROUTINE AFTER BASIC				
014E		ORG	MEMST	CHANGE START OF MEMORY
014E 24 99		FDB	FINI	NEW START OF MEM

```

*
* TO IMPLEMENT, WE MUST FIND ROOM
* IN THE COMMAND VERB TABLE..SINCE
* SWTPC HAS LEFT NO EXTRA ROOM,
* I WILL CHANGE THE NAME OF TAPPEND
* TO TA (I NEVER USE IT ANYWAY)
* AND USE THE SPACE TO INSERT THE
* DC COMMAND

```

* BE SURE AND CHECK YOUR ADDRESS FOR TAPPEND
 * AND MEMEND (CONTENTS OF \$14E) THEY MAY
 * BE DIFFERENT

02FD		ORG	TAPADD	TAPPEND IN TABLE
02FD 54		FCC	'TA'	CHANGE TO TA
02FF 00		FCB	0	
0300 0F 52		FDB	TAPEND	TAPPEND ROUTINE ADR
0302 44		FCC	'DC'	
0304 00		FCB	0	
0305 24 44		FDB	DC	

* OLD CONTENTS OF LOC \$14E TELL U WHERE TO
 * START THE PATCH
 *

2442		ORG	\$2442	START OF PATCH
2442	TEMPX2	RMB	2	
2444	DC	EQU	*	START OF PROGRAM
2444 DE 34		LDX	\$34	PICK UP COMMAND LINE
2446 BD 0B 8C		JSR	SKSP	SKIP LEADING SPACES
2449 DF 36		STX	\$36	
244B CE 70 00		LDX	#DOSBUF	LOAD DOS BUFFER
244E FF 70 94		STX	BUFPNT	INIT DOS POINTER

* TRANSFER FROM BASIC TO DOS'S COMMAND

* BUFFER AREA

2451 FF 24 42	DC1	STX	TEMPX2	
2454 DE 36		LDX	\$36	
2456 A6 00		LDA A	0,X	
2458 08		INX		
2459 DF 36		STX	\$36	
245B FE 24 42		LDX	TEMPX2	
245E A7 00		STA A	0,X	MOVE TO COMMAND BUFF
2460 08		INX		
2461 BC 70 7F		CPX	DBEND	END OF BUFFER?
2464 27 11		BEQ	ERROR	EXIT WITH ERROR
2466 4D		TST A		ARE WE DONE?
2467 26 E8		BNE	DC1	NO KEEP MOVING
2469 09		DEX		OVERWRITE NUL WITH CR
246A 86 0D		LDA A	#\$D	CR
246C A7 00		STA A	0,X	
246E BD 71 42		JSR	DOCMND	CALL DOS AS SUBROUTINE
2471 5D		TST B		ANY ERRORS?
2472 26 03		BNE	ERROR	YES, TELL OPR AND GO BASIC
2474 7E 10 79		JMP	BASBAK	GO BACK TO BASICS
2477	ERROR	EQU	*	ERROR ROUTINE
2477 CE 24 80		LDX	#ERST	POINT TO ERROR STRING
247A BD 71 18		JSR	PSTRNG	PRINT IT
247D 7E 01 03		JMP	\$0103	BASIC WARMS
2480 45	ERST	FCC	'ERROR IN DC COMMAND LINE'	
2498 04		FCB	4	
2499	FINI	EQU	*	
		END		

NO ERROR(S) DETECTED

SHOWS AND THINGS

68 MICRO JOURNAL TRIES TO MAKE MOST OF THE COMPUTER SHOWS. IN JUNE WE EXHIBITED (?) AT THE ATLANTA HAMFEST WHICH HAD A LARGE COMPUTER ATTENDANCE. THE SERVICE WAS EXCELLENT AND EXHIBITORS AND EXHIBIT GOERS ALIKE WERE SEEMINGLY WELL PLEASED AT THE TURNOUT AND FINE WAY EVERYTHING CAME OFF. WE MET A LOT OF FOLKS DEEPLY INVOLVED WITH THE 6800 AND SOLD A GODDLY PORTION OF SUBSCRIPTIONS.

ALL IN ALL I FEEL THAT THE ATLANTA SHOW WILL PROSPER. THEY KNOW HOW TO PUT IT ON. EVERYONE I SPOKE TO WAS WELL PLEASED WITH THE WAY THINGS WERE RUN. WE DEFINITELY PLAN ON BEING BACK NEXT YEAR.



THE CHARACTERS ARE L TO R MICKEY FERGUSON ASSISTANT EDITOR, JOYCE WILLIAMS (THE MOVING POWER BEHIND 68 MICRO JOURNAL) AND LARRY WILLIAMS EXECUTIVE EDITOR.



L TO R YOURS TRULY AND MICKEY HASHING OVER THE CONTENTS OF 68 MICRO WITH A 6800 USER.



BILLY GAGE OF DIGITAL RESEARCH CORP. SHOWING THEIR NEW S50 BUS 16K MEMORY BOARD (TO BE AVAILABLE SOON). MANY WILL REMEMBER BILLY AS ONE OF THE ORIGINAL S&D SALES TEAM. WE WISH BILLY WELL IN HIS ENTRY TO THE S50 BUS GANG.

A FEW MONTHS AGO WE MADE A ONE DAY 'QUICKIE' RUN DOWN TO THE SWTPC WORKS, IN SAN ANTONIO, TEXAS. AS MANY OF OUR READERS USE SWTPC COMPUTERS AND OTHER PRODUCTS, WE THOUGHT YOU MIGHT BE INTERESTED IN A FEW PICTURES OF THEIR PLANT. THE ENTIRE OPERATION IS ONE OF PRODUCT DEVELOPMENT AND PLANT EXPANSION. ONE FACT IS VERY EVIDENT, THEY ARE GEARED FOR MASS PRODUCTION IN A BIG WAY. ONE GETS THE FEELING, TOURING THE WORKS, THAT SWTPC WILL BE AROUND FOR A LONG TIME.

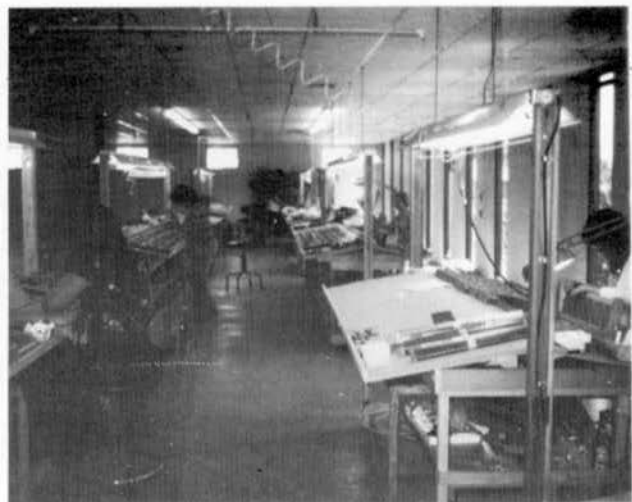
IN THE COMING MONTHS WE WILL PICTURE TOUR OTHER 6800/09 PRODUCT MAKER'S FACILITIES, AND GIVE YOU A PEEK AT THEIR OPERATIONS.



L TO R GEORGE WENTZ (SWTPC ADVERTISING DIRECTOR), PARIS COCKINOS (68 MICRO FAR EAST REP.) AND DAN MEYER SWTPC PRESIDENT.



A CORNER OF THE MODERN SWTPC REPAIR AND SERVICE DEPARTMENT.



ONE OF THE MANY PRODUCTION LINES PRODUCING 6800 SWTPC PRODUCTS.



ROW, UPON ROW, UPON ROW OF SWTPC CT-82 VIDEO TERMINALS BEING BURNED IN AND ADJUSTED.



THE CABINET SHOP; HERE SWTPC MAKES ALL THEIR CABINETS AND COMPUTER FURNITURE.



THE TEAM OF NORM AND DENNIS, THE SWTPC SOFTWARE CODERS, HARD AT WORK, UNFORTUNATELY THE SCENT OF INCENSE BURNING CANNOT BE PASSED ALONG ON THE WRITTEN PAGE. HOWEVER, I DID DISCOVER A DEEP SECRET OF GOOD CODING, INCENSE WHIFFING.

REPORT FROM JAPAN

Taylor Jackson
4-4-18 Kalass
Fusisawa, 251 Japan

In Japan, basic has been around for several years now, and among hobbyists Tiny basic in one version of another is probably the most widely used. Unfortunately there hasn't really been a good 6800 version around, that is until recently. ASCII magazine (Japanese) has recently published two great Tiny interpreters.

In July '78 "GAME" was released. This is an expanded version of VTL with some interesting bells and whistles (do, until-for next loops, arrays) it takes up about 1.5K for the interpreter alone. With a monitor, save-load (load to any address) and string editor it goes up to about 2.5K. The main features of this interpreter are it's speed and stinginess with memory. (about 20-30%, less memory required than full keyword type interpreters.)

Next in April '79 NAKAMOZU Tiny Basic (NTB) was released. This is the first Tiny interpreter written for a CRT based system to come out. The main features common to both GAME and NTB are:

1. Do until loops
2. For next loops
3. 1 dimension arrays
4. Peak and poke commands
5. Calls to link with machine language subroutines
6. Decimal and Hex. can be used freely
7. Real time input
8. They are FAST

Using the bench mark tests from kilobaud I came up with the following results:

Test	1	2	3	4	5	6	7
Game	1.3	3.5	7.5	8.5	10.5	18	23
NTB	.8	7.5	14	13	17	26	37
Pittman	a	37	61	62	83	280b	c
Tiny							

a: no for next loops
b: used counting loop to replace for-next
c: no arrays

I ran these on a Hitachi 6800 @1MHz

As you can see the days of making a cup of coffee between input and response are gone.

Game is the obvious winner in the speed race but this is due to using "system variables" rather than keywords. However this test doesn't really give a true indication of NTB's speed. In actual applications (longer programs) NTB should perform much better. For example in the case of GO TO, or GOSUB, to a higher line number NTB will begin the search from the present line rather than from the beginning.

Also searches through the statement and function tables are very time consuming. In the case of $A=1+B*C+10*D$, this would usually require 1 check of the STATEMENT table and 5 checks through the Function Table. In this type of operation each table has to be checked to the end.

NTB will carry out these searches only when necessary so there should be a noticeable gain in speed on longer programs. (I found it about 2.5 times faster than the PALO ALTO Tiny on a friends 8080)

The Do until and For Next loops also will allow a much cleaner program, giving a further increase in speed.

Now let's look at the general characteristics.

	Interpreter number range type size	
GAME	1.5 K	-32768/+32767 integer
NTB	3 K	" / " "
Pittman	2.5 K	" / " "
Tiny		

Not so much difference in size. They are all well in the Tiny category. But if we look at the instruction sets for them the differences will show up.

Pittman Tiny

Commands	Statements	Functions	Variables
*Clear	*End	Run	A - Z
*List	*GoTo	USR	
*Run	*GOSUB		
	*IF THEN		
	*INPUT		
	*LET		
	*PRINT		
	*REM		
	*RETURN		

single statement per line

NTB

Commands	Statements	Graphic Statements
*AUTO	DATE	*COPY V-RAM to printer
*APPEND	DO	*CLR
*DEL	UNTIL	*CURS
*EXIT	END	*NEG (Reverse back-ground+display)
*LIST	FOR-TO	*!W(x,y) turn bit xy on
*LOAD	NEXT	*!B(x,y) " " " off
*NEW	STEP	
*RUN	GOSUB	*!R(x,y) reverse bit xy
*SAVE	GOTO	
	IF	
	LET	Graphic Functions
	INPUT	*!P(x,y) read bit x,y

POKE
PRINT
REM
RESTORE
RET
STOP
THEN

off=0
on =1
char=100

*program pointers

☒ EOF MARK

(=)

(&)

Cold start

or after new command

PROGRAM ☐ EOF

After input

(=)

&

When EOF=\$FF program can be written into

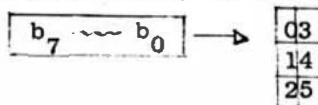
When EOF \$FF program cannot be written into

*Multiple programs may be loaded throughout available memory or run from programs in ROM. When changing to a new program the starting address is set by inputting =start address and the EOF is found and set by ==.

The new program is then ready to go this way multiple programs may be placed throughout the memory. (no linkage available though)

You can see from this that GAME has some interesting features and NTB supports all of the PALO ALTO TINY instructions (abbreviations are the same also) plus having many additional features.

The graphic commands in NTB are quite useful but also graphics and special symbols may be mixed freely with text. This is done by shifting the keyboard into a "graphic" mode thru software. At present we are using a cyclic 4 stage shift; -ASCII JIS (Japanese characters), Graphic, Control Code. (no control code on our pocket keyboard). This, of course, can be easily rewritten to meet your own needs. In the graphic mode the lower 4 bits are output directly to the screen as



This allows interesting graphics to be mixed with text.

The video ram we are using at present is very similar to the TRS-80 video board, and allows this type of limited graphics. The graphic commands will have to be adapted to your own video board but this should be easy to accomplish.

I/O Routines

Both GAME and NTB are using MIKBUG type I/O. The I/O parameters are handled in ACCA. The other registers should be preserved. They can be run on a teletype but NTB should really be run on a video system capable of graphics, to utilize it fully.

Functions	16Bit Functions	Formating
ABS	AND	USING
GET\$	OR	TAB
KEY	XOR	CHR\$
MOD		HDF
# (PEEK)		(4 digit hex)
READ		HDT
RND		(2 digit hex)
SGN		
USER		

multiple statements O.K.

GAME

Commands	Statements
0 or /n list(from n)	A=B Let(not written)
#=1 run	#=100 Goto 100
&=0 new	!=100 GoSub 100
&:0)=\$FF open file*	} ret
&:0)=\$FO lock file*	>=n user(N)
= search end of file	;=(A=1) IF
=n change program	J=2,20 For J=2 to 20
start* address	Next J-Step 2 @=J+2
*=n change ram end	Do @
#n, old string, new string, edit line	Until A=2 @=(A=2)

Functions
'n Rnd(n)
%(A/B) MOD(A,B)
+n ABS(n)
Not

GAME

Input	Output
A=? input A	?(n)=A output least n digits (leading 0 suppressed) of A
A=\$ input character	??=A output A (4 digits Hex)
	?\$=A output least significant byte of A (nex-2 digits)
	\$=A output ASCII character for least significant bit of A
	.=A output n spaces
	/ CR LF
"STRING"	output quoted string

8300



FEATURES

Standard

- Bidirectional Printing
- Character Set of 96 Symbols
- Tractor Feed
- One Line Internal Buffer
- 80 Character Print Line
- Double Size Character Set
- Low Cost

SPECIFICATIONS

Physical

Height	7.3 inches
Width	17.7 inches
Depth	14.8 inches
Weight	22 pounds

Environmental

Temperature	-25°-60°C (storage)
	10°-35°C (operating)
Relative Humidity	0-90% (storage)
	10-80% (operating)

Power Requirements

Voltage	115VAC ±10%, 60Hz
Watts	100W operating, 7W stand-by

SWITCH-INDICATOR CONTROLS

External Switches	Power On-Off Select-Deselect Line Feed
Internal Selector Switches	Print Direction (↔ or →) SO/SI or SO only Non-Auto LF or Auto LF on CR code Non-Printing or Printing on LF, VT, FF codes
Internal Switches	Paper Empty Case Cover Lock

CHARACTERISTICS

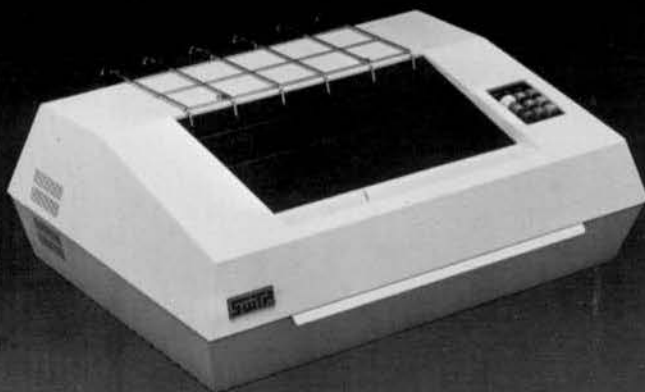
8300

Print Features	125 characters per second 60 lines per minute 8.0 inches printable width 10 columns per inch (normal width) 5 columns per inch (double width) 1/6 inch line spacing
Form Feed	Pin Feed method 10 lines per second (slew speed) Loading from either bottom or rear
Forms	Pin-feed type 4.5 inch-9.5 inch including sprocket margins 0.013 inch maximum form thickness
Interface	8 bit parallel method
Control Signals	ACKNOWLEDGE, BUSY, SELECT, DATA STROBE, INPUT PRIME, FAULT, INPUT BUSY, PAPER EMPTY
Control Codes (ASCII)	CR, LF, VT, FF, CAN, SO, SI, DC1, DC3, GS, RS, US
Character Format	96 characters ASCII 5 x 7 dot-matrix Impact printed in normal width and double width
Character Buffer	1 line (80 characters in normal width, 40 characters in double width)
Print Head	
Life Expectancy	100 x 10 ⁶ characters



SOUTHWEST TECHNICAL PRODUCTS CORPORATION
219 W. Rhapsody
San Antonio, Texas 78216
(512) 344-0241

6540 SERIAL PRINTER



SPECIFICATIONS

Physical

Height	10 inches
Width	27 inches
Depth	19 inches
Weight	85 pounds

Environmental

Temperature	32–104°F, 0–40°C
Relative Humidity	10–90%

Power Requirements

Voltage	115 ± 10% AC, 60Hz
Phase	Single
Watts	150

FEATURES

Standard

Bidirectional Printing
Horizontal and Vertical Tabs
Character Set of 96 Symbols
Character View
Forward and Reverse Line Feeding
Line Feeding in Increments of 1/2, 1/6 and full line
512 Character Internal Buffer
132 Character Print Line
Double Size Character Set

SWITCH-INDICATOR CONTROLS

On/Off, On/Off Indicator, Run/Hold, Home Paper, Forms Override, Space Paper, Vertical Positioning, Data Communications: Local/Remote, Half/Full/Echoplex, 110/300/1200 baud, Ready Indicator, Auto Answer.

CHARACTERISTICS

6540

Print Method	Serial/Impact
Character Structure	9 x 7 Dot Matrix (.105" high x .075" wide)
Printing Speeds	
Print Rate	120 characters per second
Tab/Carriage Return	36 inches per second
Equivalent Rate	165 characters per second unidirectional
Line Feed	4.5 inches per second
Data Input	Serial
Code	USASCII
Format	
Print Positions per Line	132
Horizontal Spacing	10 characters per inch
Vertical Spacing	6 lines per inch
Forms	
Dimensions	2½" to 15" width
Type	Continuous, sprocket fed
Number of Parts	Original and 4 carbons
Inking System	Cartridge ribbon
Transmission Rate	110, 300, 1200 baud—Operator selectable
Interface	RS 232-C or 20MA current loop
Type	Asynchronous



SOUTHWEST TECHNICAL PRODUCTS CORPORATION
219 W. Rhapsody
San Antonio, Texas 78216
(512) 344-0241

Software for GAME

GAME

Save Load Routine

This routine will allow you to load GAME programs into any open area in the available memory.

Assembler

A 2 pass assembler written in GAME

Diassembler

To list GAME programs into a more readable form e.g. #=100 becomes GO TO 100

String Editor

Rather than retype a whole line the editor will replace all occurrences of the old string with the new one in the line.

Also GAME 3.6 is out now. This is a 4 K. Graphic Version of GAME. It has the same instruction set as GAME. and features 34 graphic commands. However the graphic section was written for The Hitachi 6800 micro and video board. So, a lot of rewriting would be necessary to get it up and running.

In the near future ASCII plans to release a GAME compiler and a NTB compiler. (GAME 8080 is out in compiler form now so the 6800 version should follow soon.) Also a screen editor for NTB has been promised. I'll let you know about them as they are released.

LETTERS

DON WILLIAMS
'68' MICRO JOURNAL
HIXSON TN 37343

Congratulations on the '68 MICRO JOURNAL', you guys are doing a wonderful and long needed job of getting the word out to the users of all 6800 equipped systems. It is the first chance that most of us have had to get a 'look' at other 6800 systems, and find out what other users are doing.

See for some information on one of your advertisers, after a long delay I decided to change over to FLEX-2 and needed a 16K board to put it on, after looking and reading all I could find on the boards available for my GUTPC box I decided to get it from BIRIX. I called them on July 2 and talked to Bob Phillips. I told him that I had read their ad in '68' MICRO JOURNAL and wanted them to ship me a 16K RAM board. Bob told me that they were running behind because of their advertising in the '68' MICRO JOURNAL, but they would ship to me as they could. Expecting a long delay and never knowing just when I would be able to expect shipment, I sat down for a several long wait. You can imagine my surprise when by return mail I was notified that "my" board was on the burn is rock and would be off on 7/16 and would be shipped as soon as it was tested", signed /Richard Don/

If this is an example of the way they are going to run their company, they are going to be one of the ones that make it.

Fast service and Feedback, almost unheard of in this modern world.

Keep up the good work, there are a lot of people like me that don't have a local computer store, or other hobbyists to work with, and need a contact with the outside world to keep up with their hobby.

Very truly yours

James D. Caldwell
James D. Caldwell

5240 S. W. Dosch Rd.,
Portland, Oregon 97201

June 20, 1979

Don Williams, Editor
'68' Micro Journal
3018 Hamill Rd.,
Hixson, Tennessee 37343

Dear Don:

Congratulations to Mickey Ferguson on his very well-written article and program Basic Renumbering in the June issue of 68MJ. The well-annotated source code was a joy to read.

I would, however, suggest de-fusing the bomb in the FNDLIN routine, which Mickey warned about in the text. The patches suggested here may make the program bomb, but at least the source file will be preserved in usable form, and normal debugging procedures can be used to fix any resulting problems.

(a) For any GOSUB or GOTO calling for a non-existent line number within the file range, assign the next higher valid number. Line numbers are always in ascending sequence in the file, so it takes only a minor code-change to do this.

(b) For line numbers beyond the file range, assign Line #9999 to any unfindable GOTO or GOSUB. After re-numbering, there will be no such number and BASIC will tell the user all about it later.

Mickey's code is pretty tight, but I found a way to shoehorn the extra two bytes into the same space (changing his "do while" to a "do until" -- safe, since we are already assured that the line-number table has at least one entry).

The "9999" entries will typically be generated when a programmer tries to re-number a partially-entered program with unresolved forward references. These lines will have to be fixed manually -- but then, they probably would have to be fixed anyway. Under typical circumstances, the renumbering will never be done until the whole program is entered.

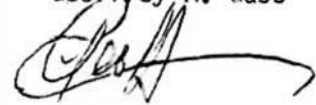
Your magazine really hits the spot for this large but somewhat neglected tribe of 6800 users. Hope you can keep up the good flow of information and advertising for a long time to come. It's really an advantage to be able

PAGE 001 RENUMPAT

to have 6800 and SS-50-compatible hardware and software ads all in one place, and not have to hunt for them through the myriad S-100 ads in the other mags.

Yours very truly,

Geoffrey A. Gass



Encl.

c: Mickey Ferguson
Trenton, GA 30752

00010		NAM	RENUPAT Patch to Ferguson's RENUMBER
00020		OPT	O,S,NOG
00040		*Patch to assign next valid line number	
00050		*when GOTO or GOSUB calls an invalid line;	
00060		*assign 9999 if called line is beyond file.	
00080		*Geoffrey A. Gass	June 20, 1979
00100		*External References	
00120	002A	NEXTBA EQU	\$2A
00130	C2C1	TEMP1 EQU	\$C2C1
00140	C2C5	TEMP3 EQU	\$C2C5
00160	C18B	ORG	\$C18B
00180		*FNDLIN searches table for Line # stored at	
00190		*TEMP1; puts new number into TEMP1 (BCD).	
00210	C18B DE 2A	FNDLIN LDX	NEXTBA Start of table
00220	C18D A6 00	FNDLN1 LDA A	0,X Line # in table
00230	C18F B1 C2C1	CMP A	TEMP1 Line # - operand
00240	C192 27 10	BEQ	FNDLN2 MSB's equal? Check LSB's
00250	C194 24 15	BCC	FNDLN5 Line # greater? Use it.
00260	C196 08	FNDLN4 INX	Operand greater than Line #
00270	C197 08	INX	Step to next Line #
00280	C198 08	INX	At least 1 entry guaranteed
00290	C199 08	INX	by earlier check.
00300	C19A 8C C2C5	CPX	TEMP3 To end of list?
00310	C19D 26 EE	BNE	FNDLN1 If not, keep going.
00320	C19F CE 9999	LDX	#9999 Operand beyond file.
00330	C1A2 20 09	BRA	FNDLN6
00340	C1A4 E6 01	FNDLN2 LDA B	1,X Get LSB
00350	C1A6 F1 C2C2	CMP B	TEMP1+1 Line # - operand
00360	C1A9 25 EB	BCS	FNDLN4 Operand greater? Next Line #.
00370	C1AB EE 02	FNDLN5 LDX	2,X At or beyond match
00380	C1AD FF C2C1	FNDLN6 STX	TEMP1 New operand (in BCD)
00400		END	FNDLIN

NEXTBA 002A
 TEMP1 C2C1
 TEMP3 C2C5
 FNDLIN C18B
 FNDLN1 C18D
 FNDLN4 C196
 FNDLN2 C1A4
 FNDLN5 C1AB
 FNDLN6 C1AD

TOTAL ERRORS 00000

June 16, 1979

Enclosed is a check for \$3.50, please send back issue Vol.1 number two to:

Martin R. Furehjein
 Accutest Corp
 25 Industrial ave.
 Chelmsford, MA 01824

If you ever reprint number one, I'd sure like to order it.

I have the following comment re. "6800 timing delay" in Issue 3 - Just in case another couple of hundred readers haven't yet known yet...

As most of us 6800 users know, a branch instruction requires four, not two cycles to execute. - this makes the timing delay kind of worthless...

However, I'd like to offer the rest of the world the following patch:

PATCH TO SNOKE SIGNAL FORMAT V 1.2

Allows formatting to 40 tracks instead of 35, when using MPI - drives...

Warning: Reformatting a disk formatted to 40 tracks on a Shugart SA400 drive may be disastrous!

Change location	from	to
0300 CE 1223 LDX #51223	CE 1228 LDX #51228	
082D 20 66 31 2E 32 ("V 1.2")	20 40 50 49 20 ("MPI")	

To those still stuck with MIKBUGS I'd like to offer some consolation...

Since MIKBUG already has taken over the SWI vector it makes it difficult to write any breakpoint handling routines of your own.

However, when the 6800 executes a WAI (wait for interrupt) SE hex instruction, the BA line (bus available) goes high (and the data/address bus is tri-stated). On the SWTPC CPU-board this signal is buffered through among other things, on a jumper. A short jumper from the output of this inverter to the WAI-line on the SS-50 bus will cause an MPI every time a WAI - instruction is executed, and since the MPI vector is accessible to MIKBUG users, we now have a way of inserting a breakpoint instruction in one byte (3E), and use it just as we would the SWI!!!

Sincerely,

M. R. Furehjein
 Martin R. Furehjein

SPHERE STILL HERE?

"Print Using" for CSS Basic

Jeff Brownstein
 2 Tor Road
 Wappingers, NY 12590

This space will be used for the benefit of 6800 Users who may not use a Mikbug (TM) style monitor or may have a home brew system configuration.

Perhaps you may remember a company called "SPHERE" which went out of business a few years ago. Not to worry. Sphere users formed an international users group to fill the void. We have a hardware repair service, a bi-monthly newsletter and a fair amount of software. One of our members purchased the Sphere bankrupt inventory so we have available new computers as well as most parts, boards (15 Dollars and up) and manuals. We welcome any users who may not heard of us as well as other computer hobbyists.

Sphere users have editors, assemblers, linking loaders for cassette and disk, Fortran, Forth, Lisp, PL/M in addition to the following Basic interpreters: Microsoft, SWTP, Programma, MSI and CSS. We have Chess and other game programs up and running also.

My interest in improving our Basic has led me to work with CSS which runs without problems and is easily enhanced. The following additions

M 6800 PASCAL

You don't need a "mini-sized" micro to benefit from this new implementation of the increasingly popular high level language PASCAL. All you need is a S M I P 6800 system (or equivalent) with sufficient hardware to support the I S C FLEX 1.0 operating system. So at least it is possible to compile and run PASCAL programs in as little as 12K + 4K bytes, using 1 mini floppy disc.

The run-time system interfaces fully with FLEX, permits user device handling, and includes a paging facility which is invoked automatically if there is insufficient real memory for a large program.

In a 32K byte/1 Mhz system with dual floppy discs, PASCAL programs can be compiled at over 80 lines/minute. With only 16K + 4K bytes, compilation is at 35 lines/minute, under the paging mode of execution. The P-code generated by the compiler is compact and efficient, so that programs execute tens of times faster than is possible with conventional (e.g. BASIC) interpreters.

The compiler is written in the subset of PASCAL which it supports, and includes Files, Procedures, Functions, Recursion, Sets, Arrays and CASE statements as well as the looping and branching constructs REPEAT...UNTIL, WHILE...DO, and IF...THEN...ELSE. Among the standard procedures and functions provided are those favourites with "micro" users - PEEK, POKE and USER.

Release Version 1.0 of the PASCAL compiler and P-code interpreter/ run-time system are provided on a FLEX 1.0 format mini floppy disc. User documentation, useful utilities and specimen programs are also supplied.

Further details may be obtained from the sole distributor:

LUCIDATA (PASCAL Division),
 POSTBOX 223,
 VOORBURG 2271 EG (ZH),
 NETHERLANDS.

are up on my system: DELETE, EDIT, PRINT USING, CHAIN, CALL, INKEY, PRETTY PRINT, IF THEN ELSE, ON ERROR GOTO, REALISTIC BACKSPACE, EXPANDED COMMAND TABLE, BINARY CASSETTE FILES for PROGRAMS and DATA, DISK SAVE, LOAD and APPEND for ICOM 8" DISK, DISK DATA FILES.

Yet to be implemented are: machine language (fast) sort, MAT PRINT, MAT READ, LINPUT, PLOT, SIZE and RENUMBER.

Below is an example of my MOD to permit prettyprinting with CSS. The MOD is unusual in that it merely requires a new command in the table and nothing else. The entry will be 2A 00 019A and could point to any location holding a 39. We have created a new kind of REM statement with the name of asterisk. This new REM allows colons to vector for multiple statements per line. Note that some of the lines have two asterisks because if the first character after the REM is a space Basic will shift all text to the left (prohibiting the prettyprinting). Labels can be placed after the asterisks allowing comments within a line instead of on a separate one.

```

0010 * PROGRAM TO SORT FIRST N POSITIVE INTEGERS
0020 * FOR A INPUT VALUES OF N (N = 100)
0030 *
0040 * *      :LET S=0
0050 * *      :INPUT A
0060 *
0070 * *      :FOR I = 1 TO A
0080 * *          :INPUT N
0090 * *          :FOR J = 1 TO N
0100 * *              :LET S = S + J
0110 * *          :NEXT J
0120 * *          :PRINT "SUM OF FIRST "; N; " INTEGERS IS "; S
0130 * *      :NEXT I
0140 *
0150 *
0160 * END

```

PRINT USING FOR CSS BASIC (version 4.0)

Jeff Brownstein
2 Tor Road
Wappingers, N.Y.

Various Basics handle this function differently and with a wide range of features. This implementation is very useful but cannot include every possible syntax.

One sets up an IMAGE line, for instance: 10:/GET #.#.## '!!!!'
The image line is really a REM in disguise. It is allowed by entering into your command table 3A 00 12FD. Now what is that slash after the colon? You may have noticed that if the first character of a REM is a space, Basic shifts all text to the left. Our image line cannot tolerate this so the first character must be something else. I have made the program change slashes to spaces on execution so you can represent spaces with slashes in the IMAGE line always. In other words if the first character is to be a space a slash must be used in that slot.

The word GET is a literal. Literal characters are printed as is (except for # and ').

The representation **##.##** is a numeric or evaluated numeric expression. **Print Using** will handle **X**, **SGN(X)**, **ABS(X)**, **ASC(X)** etc. The number of #s to the left of the decimal point will govern how many places are to be printed. Warning: Basic will print a space after your numeric so you might as well allow for it in the image line. If, occasionally, the space must be suppressed just change the number to a string variable. The format **###** will give you digits as previously defined in your program. To get integers, place **INT(X)** in the image line.

Apostrophes indicate strings or string expressions. Valid are: **A\$**, **MID\$(A\$,1,3)**, **"ABCDEF"**, **VAL(A\$)** etc. If your string is too short it will be padded on the right with spaces; if too long it will be truncated (all according to how many apostrophes are used).

Besides the image line, the program must have a **USING** line to specify the variables or expressions to be used. I have placed **USING** in the command table. The name **PRINT USING** was long and seemed to get confused with the command **PRINT**. The **USING** line might look like: **USING 10;A;B\$** or **USING 10; INT(A); B\$** or if not at the control port **USING #7,10;A;B\$**. The command table entry might look like **55 53 49 4E 47 00 2C2E** where **2C2E** is the first byte of my program after the temporary reserved locations.

It would be possible to add my patches to **SWTP** if **RIGHT JUSTIFY** is first added. As a matter of fact I did just that to **MSI Basic**. Also some users of **CSS** may have slightly different versions. Just send me a tape or listing and I will advise you of the changes for your version.

The question of speed always comes up when discussing Basic. A friend who runs Microsoft on an Altair says that his **PRINT USING** is very slow. To test this version, I ran one thousand prints and compared to the same number of **PRINT USINGs**. The elapsed time was almost identical.

A limitation of this program is the difficulty in imbedding a comma in a number like **\$1,024.99**. One first should change the number to a string to easily imbed. Another way is shown in Gardner "A Companion to Robert H. Utterwyk's Basic Interpreters" pp. 45. Another limitation is the inability to accept the image from a string instead of a line. Write for details on extending the command table for thirty new ones.

800	310055	1		*PRINT USING FOR
803	310043	2		* CSS BASIC VER 4.0
806		3		ORG \$2100
2100		4	POINT	EQU \$2C
2100		5	STACK	EQU \$3A
2100		6	DIG	EQU \$58
2100		7	BTEMP1	EQU \$76
2100		8	BTEMP2	EQU \$82
2100		9	JUST	EQU \$9B
2100 00		10	DIGITS	DS 1
2101 00		11	RJUST	DS 1
2102 0000		12	TEMP1	DS 2
2104 0000		13	TEMP2	DS 2
2106 00		14	APOST	DS 1
2107		15		ORG \$2107
2107 9658		16	LDA	DIG SAVE DIGITS VAL
2109 B72100		17	STA	DIGITS STORE IT
210C 969B		18	LDA	JUST SAVE RJUST
210E B72101		19	STA	RJUST
2111 8639		20	LDA	=\$39
2113 B71176		21	STA	\$1176 1 VAR AT TIME
2116 BD109A		22	JSR	\$109A GET PORT
2119 DE2C		23	LDX	POINT FIND IMAGE LIN
211B BD096E		24	JSR	\$096E
211E BD0933		25	JSR	\$0933

2121	2405	26		BCC NOERR
2123	C607	27		LDAB = \$07
2125	7E0B5A	28		JMP \$0B5A
2128	08	29	NOERR	INX
2129	08	30		INX
212A	08	31		INX
212B	08	32		INX
212C	08	33	TIM	INX
212D	A600	34	READ	LDAA 0,X END IF IMAGE?
212F	4D	35		TSTA
2130	2615	36		BNE SPAC
2132	8681	37	RESTOR	LDAA = \$81 RSTOR POINTRS
2134	B71176	38		STAA \$1176
2137	B62100	39		LDAA DIGITS
213A	9758	40		STAA DIG
213C	B62101	41		LDAA RJUST
213F	979B	42		STAA JUST
2141	BD111A	43		JSR \$111A CONTINUE
2144	7E12FD	44		JMP \$12FD BASIC
2147	812F	45	SPAC	CMPA = \$2F
2149	2607	46		BNE KPL
214B	8620	47		LDAA = \$20 LOAD SPACE
214D	BD01F1	48	OUT	JSR \$01F1
2150	20DA	49	LOOK	BRA TIM
2152	8127	50	KPL	CMPA = \$27 TST FOR APOST
2154	2706	51		BEQ HMA TO COUNT APOSTS
2156	8123	52		CMPA = \$23 TST FOR NUMBR
2158	2757	53		BEQ NUM
215A	20F1	54		BRA OUT OUTPT LITERAI.
215C	7F2106	55	HMA	CLR APOST
215F	08	56	LOOP	INX
2160	7C2106	57		INC APOST
2163	A600	58		LDAA 0,X
2165	8127	59		CMPA = \$27
2167	27F6	60		BEQ LOOP
2169	FF2102	61		STX TEMP1
216C	8D6F	62		BSR FIND FIND ; OF PU
216E	DE82	63		LDX BTEMP2
2170	DF76	64		STX BTEMP1
2172	BD1731	65		JSR \$1731 EVAL STRING
2175	9F3A	66		STS STACK
2177	9E82	67		LDS BTEMP2
2179	34	68		DES
217A	32	69		PULA
217B	BD01F1	70		JSR \$01F1 OUTPT STR CHR
217E	32	71	PUL2	PULA
217F	4D	72		TSTA
2180	2616	73		BNE LOOP1
2182	7A2106	74		DEC APOST
2185	270A	75		BEQ RST
2187	8620	76	SPA	LDAA = \$20
2189	BD01F1	77		JSR \$01F1
218C	7A2106	78		DEC APOST
218F	26F6	79		BNE SPA
2191	9E3A	80	RST	LDS STACK
2193	FE2102	81	RST1	LDX TEMP1
2196	2095	82		BRA READ

2198	7A2106	83	LOOP1	DEC APOST
219B	2705	84		BEQ LOOP2
219D	BD01F1	85		JSR \$01F1 OUTPT STR CHR
21A0	20DC	86		BRA PUL2
21A2	20EF	87	LOOP2	BRA RST1
21A4	FF2102	88	NUMB	STX TEMP1 PROCESS NUMBER
21A7	8D34	89		BSR FIND
21A9	BD1106	90		JSR \$1106 BASIC PRINT
21AC	FE2102	91		LDX TEMP1
21AF	209F	92		BRA LOOK
21B1	FF2104	93	NUM	STX TEMP2
21B4	08	94	LOOP3	INX
21B5	A600	95		LDAA 0,X
21B7	812E	96		CMPA #\$2E
21B9	26F9	97		BNE LOOP3
21BB	FF2102	98		STX TEMP1
21BE	5F	99		CLRB
21BF	D79B	100		STAB JUST
21C1	7C009B	101	JUS	INC JUST
21C4	09	102		DEX
21C5	8C2104	103		CPX TEMP2
21C8	26F7	104		BNE JUS
21CA	FE2102	105		LDX TEMP1
21CD	C6FF	106		LDAB #\$FF
21CF	D758	107		STAB DIG
21D1	7C0058	108	LOOP4	INC DIG
21D4	08	109		INX
21D5	A600	110		LDAA 0,X
21D7	8123	111		CMPA #\$23
21D9	27F6	112		BEQ LOOP4
21DB	20C7	113		BRA NUMB
21DD	DE2C	114	FIND	LDX POINT
21DF	A600	115	SEM1	LDAA 0,X
21E1	813B	116		CMPA #\$3B
21E3	2703	117		BEQ SEM
21E5	08	118		INX
21E6	20F7	119		BRA SEM1
21E8	08	120	SEM	INX
21E9	DF2C	121		STX POINT
21EB	39	122		RTS
21EC		123		END

THOMAS INST. VIDEO RAM

Michael J. Morrow
 8853-B Conner Lane
 Chattanooga, TN 37421
 WA4NYT

Thomas Instrumentation of Avalon, N.J. has introduced an SS-50 buss compatible video output card. The cost is \$135.00 (assembled) or \$35.00 (bare board, with crystal and documentation) and about three days.

Operation is quite simple, consisting of just plugging the board into the buss connector, addressing the on-board RAM, and changing all jumps to E1D1 to the video routine (5000). However, there is a quick way of verifying proper operation, and that is to enter the following routine after the Thomas software has been loaded.

0000 BD
 0001 ELAC
 0003 BD
 0004 5000
 0006 7E
 0007 0000
 A048 0000

This assumes that a serial input is available at port #1 and that the video routine is located at 5000. Typing 'G' on the keyboard and following this with a Control V, Control P will home the cursor and clear the screen. You should then be able to enter characters on the keyboard and see them on the display monitor.

The display is 16 lines of 64 characters and the character is a 7x9 matrix. This requires that the video monitor have at least a bandwidth of 10MHz (no converted TV sets, please).

The documentation package, which is intended for the advanced hobbyist, is fairly complete in that all modifications were listed, however, there is not one mention of how the dip switch is to be set. Two minutes study of the schematic diagram will show the user the proper setting, but this could stymie someone who is not familiar with hardware.

The idea of generating video from microprocessor control is not new, with Don Lancaster's articles on cheap video, this product's unique quality is that throughput of the computer is only slightly degraded. This is due to high writing speeds of the memory and that vertical and horizontal sync are not generated by the microprocessor. Conceivably, the Thomas Video RAM with an old MP-A processor with another card to decode a port and read an EPROM would provide an economical alternative to the \$800-1000 terminals for the hobbyist who is on a limited budget.

NEW PRODUCTS

HEMENWAY ASSOCIATES, INC.
 101 TREMONT ST. SUITE 208
 BOSTON, MA 02108
 (617) 428-1931



Southwest Technical Products Corporation
 219 W. Riosperry
 San Antonio, Texas 78216

July 11, 1979

FOR IMMEDIATE RELEASE

CP88™ - A POWERFUL DISC-BASED OPERATING SYSTEM FOR 8800s

The most powerful operating system available for the 8800 family of microprocessors, CP88™ furnishes big system features and capabilities for microcomputers. A combination of memory-resident and transient commands provide the system's flexibility. The user can even add his own commands to the system. Plus, the Peripheral Interchange Program allows transfer of data between physical devices. Widespread operation of all disk commands lets you speedily file either individually or unidirectionally.

Other features of the operating system are:

- Complete disk-to-disk I/O
- Sequential and Random file access methods
- Dynamic allocation and extension of files
- Command files
- Chaining and overlaying of user programs
- 11 files in less than 8K and can be relocated anywhere in memory
- Extended instruction set includes 18 new 8800-type instructions (PBRCL, FLUX, etc.)
- All DOS services available through a single Supervisor call
- Easily interfaces to new devices and peripherals

As an added bonus, all of Hemenway Associates' other software runs more efficiently on CP88™. The operating system supports functions that ITRUSAT + used to provide in its runtime package. The operating system runs on Percom, ICOM, MSI, Smole Signal, Microbit and SWTPC systems. OEM inquiries invited.

NEWS RELEASE

SOUTHWEST TECHNICAL PRODUCTS CORPORATION AND TSC OFFER A CONVERSION PACKAGE TO RUN FLEX® ON PERCOM DISK SYSTEMS

San Antonio, Texas—July 11, 1979—Southwest Technical Products Corporation announced here today that they were making available a conversion package that will allow owners of Percom disk systems to use TSC software. The jointly developed package includes the FLEX® 2.0 operating system, BASIC 3.5, a controller board (assembled and tested), a cable connector and a full set of instructions and manuals.

This package is being offered in response to the many Percom owners who have inquired about using FLEX®. This will make it possible for owners of Percom systems to use a more complete and reliable DOS than has previously been available for their equipment. It will make it possible for Percom owners to exchange programs with owners of all other types of 8800/8808 systems. FLEX® is the most widely used DOS for 8800/8808 computer systems. It is now available for all manufacturers making these disk systems. The conversion package includes a single disk copy utility and will run on all single, or double headed (when available) 5 1/4 inch disk drives.

The conversion package sells for \$149.95 prepackaged, from Southwest Technical Products Corp. or your nearest SWTPC dealer. Phone orders can be accepted if payment is by Visa, or MasterCard.

Southwest Technical Products Corp.
 219 W. Riosperry
 San Antonio, Texas 78216
 (512) 344-0241

FLEX® is a registered trademark of Technical Systems Consultants, Inc.

DO IT THIS WAY:

```
3010 7D E020   TST E020 : BUSY?
3013 2B 0A     BMI 301D : YES, EXIT
3015 DE 20     LDX 20 : DATA POINTER
3018 A6 00     LDAA X,0 : GET DATA
301A B7 E021   STAA E021 : OUTPUT
301D 08        INX      : UPDATE
301E DF 20     STX 20   : POINTER
3020 39        RTS      : TO SCHEDULER
```

THE SECOND REQUIREMENT, NOT OVER A MILLISECOND PER PASS THRU A ROUTINE, IS PERHAPS ALREADY MET BY THE FIRST FOR SUCH SIMPLE ROUTINES AS TRANSLATING DATA FROM ONE INPUT TO AN OUTPUT.

HERE IS A SIMPLE EXAMPLE

I WANT TO TYPE ON MY ASCII KEYBOARD AND TRANSLATE THE ASCII TO BAUDOT (BECAUSE I OWN PLENTY OF NICE 5-LEVEL BAUDOT PRINTERS THAT DIDN'T COST ANYTHING). I WANT TO HANDLE UPSHIFTS AND DOWNSHIFTS AS REQUIRED BY THE OUTPUT PRINTER IN BAUDOT. I WANT TO PRINT ON THE BAUDOT MACHINE.

THE TASK AT 1000 IS A SIMPLE INPUT ROUTINE FROM THE KEYBOARD, EXCEPT TURNED AROUND AS SHOWN ABOVE, SO THAT THE SUBROUTINE RETURNS IMMEDIATELY IF NO CHARACTER IS READY.

THE TASK AT 2000 STARTS BY CHECKING TO SEE IF A CHARACTER IS WAITING, STORED IN TEMPORARY T1 BY TASK 1000. IF NOT, RETURN IMMEDIATELY.

THEN CHECK TO SEE IF THERE IS ROOM FOR AN OUTPUT CHARACTER IN TEMPORARY LOCATION T2. IF THERE IS NO ROOM, RETURN IMMEDIATELY.

IF WE PASS THESE TESTS, CHECK TO SEE IF THE PRINTER IS IN THE SAME CASE AS THE NEW CHARACTER. IF NOT, WE WILL HAVE TO SHIFT. SO PUT THE PROPER SHIFT CHARACTER IN A SECOND TEMP. LOCATION, T2; THEN RECORD IN T3 THAT WE ARE NOW IN THE NEW CASE; THEN RETURN.

IF THE CASE IS CORRECT, TRANSLATE THE CHARACTER AND PUT IT IN T2; THEN RETURN.

THE THIRD TASK, AT 3000, LOOKS TO SEE IF THERE IS A CHARACTER WAITING IN T2. IF NOT, RETURN IMMEDIATELY.

IF THERE IS A CHARACTER, CHECK TO SEE IF THE PRINTER IS BUSY. IF IT IS, RETURN IMMEDIATELY.

IF WE PASS THESE TESTS, CRAB THE CHARACTER FROM T2 AND OUTPUT IT. THEN ZERO T2 AND RETURN.

YOU WILL NOTICE THAT THESE THREE TASKS EACH GO ABOUT THEIR BUSINESS QUITE INDEPENDENT OF THE OTHERS. THREE MORE TASKS COULD BE DOING THE SAME THING FOR ANOTHER INPUT, PERHAPS FROM BAUDOT, TO ANOTHER OUTPUT. ANOTHER TASK MIGHT BE WATCHING FOR TICKS ON A CLOCK, AND KEEPING TIME-OF-DAY UPDATED. AND YET ANOTHER MIGHT BE WATCHING FOR A SWITCH OR SOMETHING INDICATING A CALL TO GO BACK TO THE MONITOR.

THATS ALL THERE IS TO A SIMPLE MULTI-TASK ARRANGEMENT. GIVE IT A TRY THE NEXT TIME YOU HAVE ASYNCHRONOUS TASKS THAT DONT SEEM TO FIT A STRAIGHT TOP-DOWN PROCESS.

N. J. THOMPSON
1615 WILDER # 401
HONOLULU HAWAII 96822

SWTPC RESET (fix)

Peter Bennett
4577 West 5th Ave.
Vancouver, B.C., Canada

From time to time (usually while de-bugging machine language programs) I have found that the front panel RESET button on my SWTP MP-68 computer will not reset the computer, although grounding the RESET line on the mother board will reset the system.

Examination of the MP-A CPU card schematic reveals that the reset button triggers a 555 one-shot, IC 11. The output of IC 11 passes through one section of IC 15, a DM8098/74366 tri-state hex inverter before going to the rest of the system. Unfortunately, the state of IC 15 is controlled by the BUS AVAILABLE signal from the CPU so that, should the CPU execute a Wait For Interrupt instruction (or, possibly some of the undefined instructions), which will set the BUS AVAILABLE line high, this inverter will go to it's high impedance state, effectively disconnecting the reset button at the very time it is most needed!

To solve this problem, this section of IC 15 can be replaced by an unused section of IC 10, a 7404 hex inverter, using the following procedure:

1. Cut pin 9 of IC 10 (7404) free from the board (leave enough of the pin on the IC so that you can solder to it)
2. Solder a short jumper from IC 10 pin 9 to IC 11 pin 3

3. Solder a wire from IC 10 pin 8 to IC 15 (74366) pin 3

It is not necessary to disconnect the unwanted section of IC 15.

With this modification, the processor will no longer be able to dislodge the reset button.

This problem will only occur on the original MP-A CPU card, and not on the new MP-A2 card.

COMPUTERWARE announces the most powerful BASIC on the M6800. It has 26 commands, 27 functions, 20 statements, and 22 disk commands along with 9 digit precision. This RANDOM-ACCESS BASIC has Logical I/O which provides hardware independence and allows passing parameters to and from assembly language subroutines. Some of the outstanding features are "PRINT USING", "ON ERROR", and "CALL". It can read text files as well as other BASIC programs. In the immediate mode it can edit a line without having to retype the line. "REPLACE" allows a modified program to be saved to the disk under its original name. It allows the creation, easy manipulation, and even expansion of true RANDOM FILES. The random files can be accessed in a random manner or sequentially. There can be 10 sequential and 10 random files open concurrently. This is available for \$99 from COMPUTERWARE 1512 Encinitas Blvd. Encinitas CA. 92024. (714) 436-3512.

PERCOM ADDS 77-TRACK SINGLE- AND DOUBLE-DENSITY DRIVES TO LFD LINE OF MINI-DISK STORAGE SYSTEMS

Garland, Texas - May 25, 1979 - Harold Mauch, President of Percom Data Company, announced here today that the company has expanded its line of LFD mini-disk systems for 6800/6809 computers to include 77-track single- and double-density storage systems.

The LFD product line now includes LFD-800tm and LFD-1000tm

systems in addition to the LFD-400tm.

The LFD-800tm stores 200K bytes in single-density format on 77 tracks, and is available in one-, two- and three-drive configurations.

The LFD-1000tm is a dual-drive system that stores 400K bytes per disk -- 800K bytes per system -- in double-density format on 77-track disks.

Two LFD-1000tm systems provide the user a total of 1.6M bytes of on-line storage.

A system is supplied complete with an 88-50 bus controller/ interface PC card, an operating system on EPROM, an operator's manual and an interconnecting cable.

The LFD-800/800 controller/interface accommodates up to three drives and the LFD-1000tm controller/interface accommodates either one or two LFD-1000tm dual-drive systems.

In addition to MINIDOS-PLUStm, the EPROM operating system supplied with each drive system, Percom also offers two advanced operating systems, INDEXtm and CP/68[®], for use with LFD drive systems.

The Operators Manual describes each system component and includes operation, service and maintenance procedures for the drive.

Prices are as follows:

	LFD-800	LFD-1000
1-Drive	\$ 895.95	--
2-Drive	\$1549.95	\$2495.00
3-Drive	\$2195.95	--
4-Drive	--	\$8950.00

Orders may be placed by dialing Percom's toll-free number, 1-800-527-1592, and may be paid by check or money order, COD, or charged to Visa or Master Charge credit accounts. Texas residents must add 5% sales tax.

Dealer inquiries are invited.

tm trademark of Percom Data Company, Inc.

[®] trademark of Kemenway Associates

-end-

PERCOM DATA COMPANY 211 N. Kirby Garland, Texas 75042
(214) 272-3421

NOTE: ALL BACK ISSUES OF 68 MICRO JOURNAL ARE PRACTICALLY EXHAUSTED.

READERS DESIRING BACK ISSUES (EXCLUDING ISSUES 1 & 4) SHOULD GET THEIR ORDER IN SOON.....

COST PER ISSUE

\$3.50 ea. Includes postage and handling. USA

\$4.50 ea. Includes postage and handling. Foreign

Technical Systems Consultants, Inc.

new product announcement

Box 2574 W. Lafayette, IN 47906



6809 CROSS ASSEMBLER RUNS ON 6800

Designed to operate under the FLEX[®] disk operating system on the 6800 microprocessor, this 6809 cross assembler is fully compatible with both 6809 and 6800 mnemonics. Thus, existing 6800 source listings can be directly re-assembled to produce executable 6809 object code. It is also 6801 compatible. All standard mnemonics and directives are supported including macros, conditional assembly, REG, SETOP, and both SET and EQU. A LIB function allows an external source file to be read during assembly of the main source. Warning messages are supported and may be enabled or suppressed.

The software is available in binary form on a FLEX[®] 3.0 (8 inch) or FLEX[®] 2.0 (5 1/4 inch) compatible disk. Manual and disk are available for \$100.00 from Technical Systems Consultants, Inc., Box 2574, West Lafayette, Indiana 47906. Phone (317) 463-2502.

'298' for 16K Static RAM Boards

GIMIX INC., announces that it is now delivering 2 versions of 16K static RAM boards for the SS 50 bus. Both use TMS 4044 RAMS, have gold bus connectors, and are tested at 2 MHz. They have DIP switch controllable addressing, write protect, and enabling of each 4K block which allows, for example, the user to put 4K in high memory for DOS, and the remaining 12K in low memory. With the above features only, the price is '298'. The deluxe version is socketted and GHOSTable (software controllable readdressing, write protect, and enabling of each 4K block) for '388'.

GIMIX[®] and GHOST[®] are registered trademarks of GIMIX INC.

MICROWARE NEW PRODUCT NEWSLETTER

APRIL, 1979

Thank you for your inquiry about our line of 6800 family hardware and software products. We are in the process of introducing some new software to our 1979 catalog will not be ready for some time. In the interim we are presenting new product information in this newsletter.

OPERATING SYSTEMS SUPPORT

Almost all Microware software is available on cassettes for MIBUG, RT/68, SMTUG, etc. Also, our disk-based software is available for Scope Signal OOS, SMTPC Miniflex[®], and Motorola MDOS. We are currently preparing versions for the new FLEX[®] and Percom INDEX[®] disk operating systems as well.

6809 SOFTWARE

Motrola contracted Microware to produce the finest possible software for the 6809. The new software we have prepared for Motorola includes a new BASIC language system plus an operating system. This software will be available soon from Motorola and Microware. Here are a few highlights:

BASIC99 Language System

- World's fastest microcomputer BASIC interpreter
- Integrated compiler/interpreter/editor package
- Structured BASIC - will even run many PASCAL programs with minor modification, plus compatible with SMTPC and Microsoft BASICS
- Five data types: Floating-Point (9+ digit accuracy); Integer (16 bit); Byte (8 bit); Boolean; and String (variable length)
- User-defined record data structures (similar to PASCAL)
- Formatted I/O to multiple devices using OS9
- Position-independent, reentrant code
- Device-independent I/O in conjunction with OS-9
- Masked on ROM chip set

OS-9 Operating System

- Advanced design modeled after UNIX[®]
- Device-independent I/O: cassette, disk, or user-supplied drivers (Microware will market driver ROMs for popular disk controllers)
- Random-access, hierarchical file structure
- Single- or multiple-page memory management
- Position-independent masked ROM
- Compatible time-sharing version will be available

In addition to the above, Microware will be introducing a 6809 Macro Assembler, text editor, and 6809 version of A/BASIC this spring and summer. We highly recommend that before purchasing a new 6809 CPU board or computer that you investigate its compatibility with this new software and existing 6800 hardware. PERCOM and GIMIX have indicated that their new 6809 boards will be compatible with this software and present 6800 hardware. SMTPC has declined to release any data about their 6809 CPU card to date.

* MINIFLEX and FLEX are trademarks of TSC

** INDEX is a trademark of PERCOM

*** UNIX is a trademark of Bell Telephone Laboratories

SIMPLE MULTI-TASKING

Noel J. Thompson
1615 Wilder No. 401
Honolulu, Hawaii 96822

IF THE CONCEPT OF MAKING YOUR MICRO DO MULTIPLE TASKS AT THE SAME TIME FRIGHTENS YOU, PERHAPS WE CAN REDUCE MULTI-TASK OPERATIONS TO A SIMPLE LEVEL. THEN, WHEN YOU SEE HOW EASY IT IS, YOU MIGHT GIVE IT A TRY.

MULTI-TASKING REQUIRES A SCHEDULER, A SUPERVISORY PROGRAM TO DECIDE WHICH TASK TO DO NEXT. HERE IS A SIMPLE SCHEDULER:

```
100 BD 1000      COSUB 1000
103 BD 2000      COSUB 2000
106 BD 3000      COSUB 3000
109 02 02 02    ROOM FOR EXPANSION
10C 20 F2        BRANCH TO 100
```

THIS SCHEDULER IS OF ROUND-ROBIN FORM, OSTENSIBLY GIVING EQUAL TIME TO EACH SUBROUTINE IN TURN. AND IT HAS NO CONTROL OF HOW MUCH TIME EACH TASK TAKES, SO WE NEED SOME RULES, SUCH AS:

1) IF A TASK HAS TO WAIT FOR AN I/O DEVICE, IT SHOULD RETURN IMMEDIATELY INSTEAD, AND HOPE FOR BETTER LUCK NEXT TIME. (ALL MY PROGRAMS INCLUDE THE 'HOPE' INSTRUCTION, DONT YOURS?).

2) NO TASK SHOULD TAKE MORE THAN A MILLISECOND OR SO IN ONE PASS.

AS YOU CAN SEE, THE RESPONSIBILITY FOR CONTINUING OPERATION THRU THE LOOP IS ABDICATED BY THE SCHEDULER, AND LEFT UP TO THE TASKS THEMSELVES.

THIS ISN'T SO HORRIFYING IF YOU ARE WRITING DEDICATED TASKS. AFTER ALL, YOU HAVE MORE CONTROL OVER THE TASKS THAN YOU HAVE OVER THE DRIVER IN FRONT OF YOU WHO CONTROLS THE TIME THRU YOUR DAILY DRIVING SCHEDULE.

NOW, HOW ARE YOU GOING TO IMPLEMENT THE FIRST RULE FOR I/O PROCESSES? SIMPLY BY CHECKING, AS YOU ENTER A ROUTINE, WHETHER OR NOT THE PRINTER IS BUSY.

DONT DO IT THIS WAY:

```
3010 7D E020    TST E020 : BUSY FLAG
3013 2B FB      BMI 3010 : LOOP IF BUSY
3015 DE 20      LDX 20 :DATA POINTER
3018 A6 00      LDAA X,0 : GET DATA
301A B7 E021    STAA E021 : OUTPUT
301D 08         INX      : UPDATE
301E B7 20      STAA 20 : POINTER.
3020 39         RTS     : TO SCHEDULER
```


EFFECTIVE SEPT. 1, 1979

1-Year \$14.50 2 Years \$26.00 3 Years \$36.50

OK, PLEASE ENTER MY SUBSCRIPTION

Bill My: Master Charge ☐ — VISA ☐

Card # _____ Exp. Date _____

For ☐ 1-Year ☐ 2 Years ☐ 3 Years

Enclosed: \$ _____

Name _____

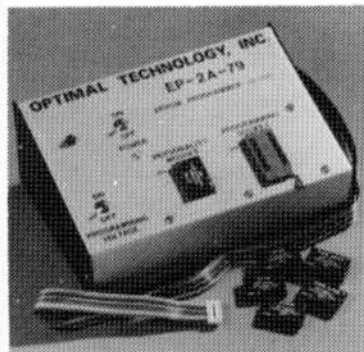
Street _____

City _____ State _____ Zip _____

My Computer Is: _____

68 MICRO JOURNAL
3018 Hamill Road
HIXSON, TN 37343

EPROM PROGRAMMER Model EP-2A-79



SOFTWARE AVAILABLE FOR F-8, 8080, 6800, 8085, Z-80, 6502, KIM-1, 1802, 2650. EPROM type is selected by a personality module which plugs into the front of the programmer. Power requirements are 115 VAC, 50/60 HZ at 15 watts. It is supplied with a 36 inch ribbon cable for connecting to microcomputer. Requires 1 1/2 I/O ports. Priced at \$155 with one set of software. Personality modules are shown below.

Part No.	Programs	Price
PM-0	TMS 2708	\$15.00
PM-1	2704, 2708	15.00
PM-2	2732	30.00
PM-3	TMS 2716	15.00
PM-4	TMS 2532	30.00
PM-5	TMS 2516, 2716, 2758	15.00

Optimal Technology, Inc.
Blue Wood 127, Earlysville, VA 22936
Phone (804) 973-5482

ED SMITH'S SOFTWARE WORKS

ANNOUNCES **RRMAC**

AN M6800 SYSTEM RELOCATABLE RECURSIVE MACROASSEMBLER & LINKING LOADER

ATTENTION ALL PROGRAMMERS: If you have been looking for an assembler with real macro capabilities, then **RRMAC** is the one for you.

Character replacement is the crux of macro expansion. **RRMAC** allows unlimited character replacement in any field of a macro model statement. **RRMAC**'s argument notation can specify replacement from any field, subfield, sublist or substring of the macro call statement. **RRMAC**'s set of macro directions supports both global and local set symbols. Set symbols can be based on either arithmetic expressions or character expressions. Macro model statements can determine attributes of set symbols or macro arguments. **RRMAC** allows macros to define new macros and to call other macros. Macro calls can be recursive, that is, a macro may call itself.

RRMAC contains a mini co-resident editor, allows spooling if desired, supports insert files, retains TSC Text Editor source code compatibility, plus many other programmer convenience features.

RRMAC can be furnished on cassette or mini-floppy in either B88 or Mini-Flex format. Comes complete with linking loader, instruction Manual/Programmers Guide & an extensively commented assembly listing.

M68RR ... cassette ... \$180.00 A 6800 to 6809 cross assembler
M68RR-D ... B88 disc ... \$150.00 version of **RRMAC** will be
M68RR-F ... FLEX disc ... \$150.00 available in June.
Specify "Mini" or Ver. 2.0

Order directly by check or MC/VISA. California residents add 6% sales tax. Customers outside of U.S. or Canada add \$8 for air postage & handling.

Dealer inquiries welcome.

FLEX is trademark of TSC

Ed Smith's **SOFTWARE WORKS**

P.O. Box 339, Redondo Beach, CA 90277, (213) 373-3360

ATTENTION SWTPC DISC SYSTEM USERS

All Ed Smith's **M6800 SOFTWARE TOOLS**

- are now available in mini-FLEX format as well as Smoke Signal Broadcasting format. See July BYTE for diskette media prices. Disk users specify SSB OR SWTPC.
- **M6800 RELOCATING ASSEMBLER AND LINKING LOADER** software for rapid program development and debugging. Some of its features are RELOCATABLE CODE-FULL ALPHABETIZED CROSS REFERENCE LISTING-BOTH GLOBAL AND LOCAL LABELS-LISTING OF EXECUTION TIME-RELATIVE BRANCH TARGET ADDRESS-ES-8 CHARACTER LABELS-CO-RESIDENT EDITOR-ENGLISH ERROR MESSAGES-80 COLUMN LISTING USING PR 40-etc.
- **M68AS** ... cassette ... \$50.00
- **M68AS-D** ... minifloppy ... \$58.95
- **M6800 RELOCATABLE DISASSEMBLER AND SEGMENTED SOURCE TEXT GENERATOR**. This software tool enables you to modify and adapt those large sized object programs and reassemble them on your system without requiring enorm. in memory. This program will produce segmented source text files with all the external linkage information required for reassembly using the above Relocating Assembler.
- **M68RS** ... cassette ... \$38.00
- **M68RS-D** ... minifloppy ... \$40.95
- **M68ASPK** Above two programs on single discette ... \$85.00
- The above two programs are furnished in relocatable format code with instruction manuals and commented assembly listings. The loader is also supplied in standard MIBUG format on cassette or as a binary file on disc to initially load the linking loader at any desired address.
- The linking loader is also available in EPROM on two 2708's for \$45.00. Specify desired address and version, i.e. cassette, FLEX or SSB. For FLEX Specify "Mini" or Ver 2.0

8-M-I-T-H-U-S

FIRMWARE from Ed Smith's **SOFTWARE WORKS**

- A 2k Monitor Disassembler-Trace Debugging Tool in EPROM. Use as stand-alone monitor or as an adjunct to your Smartbug or Swtbug. Requires ACIA as control port. Provides all the monitor commands (23) you could ever ask for, plus the convenience of a mnemonic disassembler and single stepping disassembler trace display. Interactive use of single or dual breakpoint with trace pickup at breakpoint, plus many new monitor functions and subroutines, makes this a super tool you will love to work with. Uses location \$F000 to \$FFFF. Furnished on two 2708's or one 2716. Includes Manual and commented assembly listing. Specify ACIA location and present monitor in order to keep \$A000 RAM compatibility.
- **SMITHBUG ON 2708's** ... \$60.00
- **SMITHBUG ON 2716** ... \$70.00

Get under Ed Smith's Software RUG (Relocating assembler Users Group). All RUG members will have use of a building software support library in relocatable format. Upcoming items are a Floating Point package and a Trip package.

Order direct by check, specify system configuration if other than SWTPC. California residents add 6% sales tax.

Ed Smith's **SOFTWARE WORKS**

P.O. Box 339, Redondo Beach, CA 90277, (213) 373-3350



Inventory Problems?

Are you having trouble keeping the right nuts and bolts in stock? Since even a simple mistake can cost you time and money, a good inventory system should do more than just count parts. It should tell you exactly what you need, when you need it, where to get it, and how much it will cost.

The MSI Inventory System Seven enables you to maintain a versatile data base for controlling inventory. It lists part number, description, quantity on hand, vendor, cost, selling price, optional pricing, usage levels for previous month, present month, and year-to-date, and much more.

When quantity on hand items reach minimum levels, the System Seven compiles an automatic reorder list. This list can be generated by specific vendor as well as a complete listing of all materials to be ordered.

In addition to the item listing, the Inventory System Seven "bill of materials" provides you with a complete inventory of items used in the manufacture of subassemblies and complete products. It also contains other cost items such as labor costs, total raw materials costs, and miscellaneous costs.

The MSI Inventory System Seven is built around the versatile MSI 6800A Computer with 56K of RAM. An integral dual mini-floppy memory gives you an additional 630K of memory and makes

inventory control fast and efficient. The System Seven will interface with any industry standard CRT, and you have the option of both a "daisy wheel" word processor for high quality document preparation and a dot matrix printer for high speed production.

The System Seven can be expanded to handle all your data processing needs or you can select one of nine other MSI systems now available for business, industrial, scientific, educational, and personal applications.

If you need more than just a nuts and bolts inventory system, we have more information about how the Inventory System Seven can solve your problems economically.



MSI Inventory System Seven

MSI

Midwest Scientific

220 W. Cedar, Olathe, Kansas 66061, (913) 764-3273
TWX 910 749 6403 (MSI OLAT), TELEX 42525 (MSI A OLAT)

MINI-SYSTEMS
★
CASH-FLOW
Bookkeeping
System

This mini accounts payable and general ledger system provides account codes for categorization, checking account reconciliation, year-to-date totals, a dated purge facility, and complete activity recording. Reports include expense report, account report, all activity, written checks, outstanding checks, adjustments, and deposits. Sort keys have range selections. It is written in Random BASIC for SSB DOS.

introductory price **\$99.95**

Does Your
BASIC Have:
Random Records,
PRINT USING,
ON ERROR
EDIT
... Our's DOES!

Random Access BASiC, written for the Smoke Signal Broadcasting disk system, allows the user to retrieve, change, or add a record directly within a file. Many proven application packages are available!

\$99.95

MINI-SYSTEMS
★
RANDOM V2
INVENTORY
SYSTEM

Keeps record of: Part Name/Number, Vendor Code, Selling Price, Average Cost, Quantity-on-Hand, Quantity-on-Order, Minimum Quantity, Category Code, Location Code. There are no system limits to the number of items. Reports may be sorted by Part Name/Number, Category, Location, or Vendor and a re-order report is provided. On-line search and invoicing is included. It is written in Random BASIC for SSB DOS.

introductory price **\$69.95**

COMPUTERWARE

6800 system experts

Random V2
Mailing List
System

Label printing directed to any port — optional phone number & special code—selectable label spacing —date field in each record—sorted reports or labels can be requested by range of values in fields: date, code, zip, name—title/country field in each record— all fields except date are alphanumeric — written in Random BASIC for SSB DOS.

introductory price
\$89.95

1512 Encinitas Blvd., Box 668
Encinitas, CA 92024

(714) 436-3512

LOOK TO US
FOR
HARDWARE
TOO!!!

Smoke Signal Broadcasting,
SWTPC, Anadex, Centronics,
NEC, SOROC, Micro-Term,
Sanyo, Ledex, Micro-Works, . . .

ARE YOU ON OUR MAILING LIST?

Fill out and send in the form.

If you are not in our mailing list, you will receive:

(1) A coupon worth \$5 on your first Computerware purchase.

(2) All of our current product information.

\$5

Name

Street

City

System Description:

State

Zip

\$5

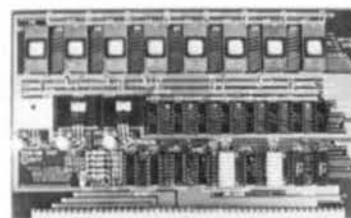
\$5

ONE COUPON PER CUSTOMER

\$5



THE CLASSICS



The first Micro Works PSB-08 PROM Board was assembled and burned in over two years ago—eons in the micro world. Designed as an efficient, cost-effective EPROM storage system for the SWTPC 6800, its flexibility accommodates all the new S-50 computers on the market—SWTPC 6809, GIMIX, MSI and Smoke Signal Broadcasting. The 2708 EPROM remains an inexpensive, capable media for storage of subroutines, I/O handlers, monitors and even BASIC interpreters while the cost and availability of 2716s still don't justify their purchase. PSB-08 has space for up to 8 2708 EPROMS and the following exclusive features:

- 1K "scratch pad" RAM—more than enough temporary storage capacity for any program requiring up to 8K of PROM
- Dip-switch addressable PROM and RAM, to start on any 8K boundary in memory
- I/O select capability lets you move the I/O locations to any unused 1K block in EPROM memory space, permitting memory expansion to a full 56K contiguous user RAM

Originally intended for use with 6800-based system software, the PSB-08 will continue to be a valuable tool for years to come with your 6809. And the relocatable I/O feature lets you keep your 6800 system up-to-date.

The past two years have seen many microcomputer products come and go. In our history, there have been no takers on the PSB-08's warranty. Like the classics, our PROM board endures. Price: \$119.95; regulated + 12v.: \$124.95

The Micro Works Classics also include:

B-08 EPROM Programmer — with all programming voltages generated on board and controlled by a safety switch with an LED indicator. An industrial quality Textool socket and extended board height allow effortless EPROM insertion and retrieval. The source listing of U2708 is included in the Owner's Manual. Price: \$99.95; reg. + 12v. \$104.95

U7808 — Utility to test, burn, verify and copy EPROMS in 2708 EPROM: \$29.95

DS-68 DigIsector® — a random access video digitizer featuring 256 × 256 picture element scan and 64 levels of grey scale; with conversion times as low as 3 microseconds per pixel. The DS-68 accepts either interlaced (NTSC) or non-interlaced (industrial) video input. Use it for computer portraiture, moving target indicators, precision security systems, fast to slow scan conversion... with clever software, the DigIsector can read just about anything. Truly a professional tool at a price you can afford: \$169.95; reg. + 12v. \$179.95

UIO Universal I/O Board — has space for a 40-pin wrap socket into which you can plug any of Motorola's 40 or 24-pin interface chips. The data and control lines are connected to the appropriate edge connector pins with all other bus connections brought out to a 16-pin socket pad. Build circuits in half the time with UIO. Price: \$24.95

DM-85 Disk Mixer — for running mixed 8 and 5 inch drives. This is an add-on board for the Smoke Signal Broadcasting BFD-68A Disk Controller. Controller mode (8" or 5") is selected on a drive-by-drive basis, so any mix of 5" and 8" drives is allowable. Its operation is completely transparent to software. This kit requires access to an oscilloscope for the setup procedure. Price: \$39.95

M6809 Emulator — a machine language program that will emulate all the functions of the Motorola 6809 third generation microprocessor. Developed for use on any 6800 computer system, the program allows software debugging and development prior to 6809 availability. Specify Smoke Signal Broadcasting or FLEX™ disk, or KCS cassette. Price: \$49.95

THE
**MICRO
WORKS**

P.O. BOX 1110, DEL MAR, CA 92014

714-756-2687

P-6800 PASCAL

- Available NOW for 6800 based systems
- PASCAL P-code compiler
- Efficient run-time system interfaces to mini-FLEX™ or FLEX™ 2.0 DOS
- 60-page user guide and reference manual
- Useful utilities provided
- Sample demo programs
- All for \$150
- VISA card accepted
- Hardware requirements - minimum for FLEX (16K)

Send for further details to:



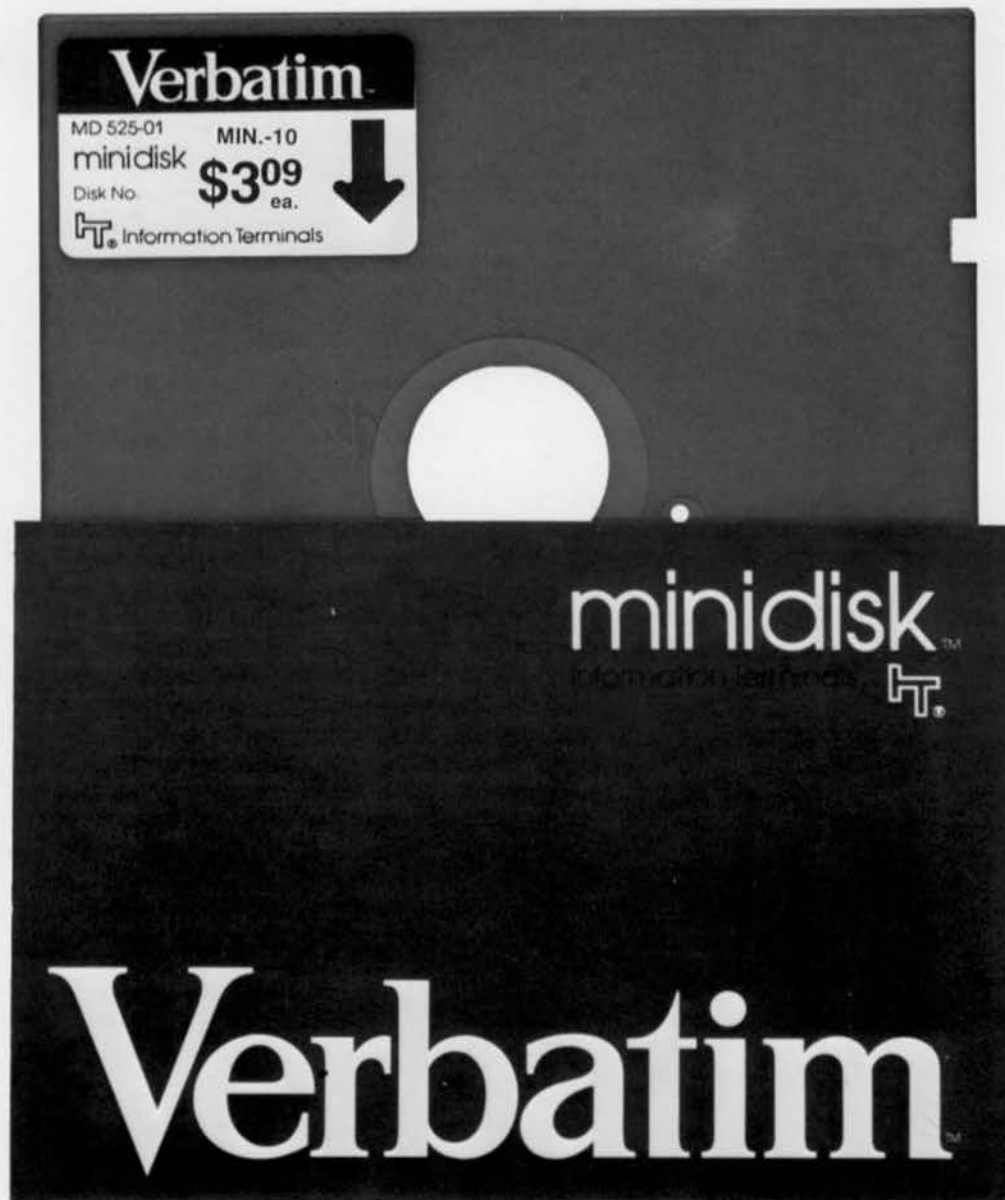
Lucidata
Oostende 223
2271 EG Voorburg
Netherlands

FLEX is the trademark of TSC Inc

5-1/4" Minidisk — Soft or Hard Sector

S
A
V
E

D
I
S
K



SOUTH EAST MEDIA SUPPLY

6131 Airways Blvd.

615-892-1328

Chattanooga, TN 37421

H H H Enterprises
Box 493, Laurel, Md.
20810 301-953-1155

SPIRIT @ \$69.95, a "FORTH"TM like language is available on 5 or 8 inch Smoke disk, with a hardcover notebook of documentation. This is a stack orientated program that compiles your statements into itself. Includes a starting dictionary of over 200 words.

NOW!!! 1st in a series of disks of goodies. STD-1 contains:

ATTRIBUTE: handles write protect, delete protect and system flags in the DOS.

LOOK: is a list that tells file type, status of flags, etc.

TMON: changes ver 4.2 & earlier for ctrl H backspace

SDC: a smart single disk copy program.

ERROR: returns text for an error msg. number.

MIRROR: makes a bit for bit copy of a disk, also for mass copying.

MAP: This elephant uses 20K RAM & will tell you more about a disk than you'll probably ever need. Will also restructure your free sector chain.

PLUS OTHERS.

Includes **SOURCE ON DISK**, object for 6/7 DOS and documentation. Price is \$35.95.

Call us for the latest news out of GIMIX and the absolutely GREAT 80 x 24 vidio board.

Call us for system integration and custom software. We use ISC terminals and GMXBUG 3.0 on our sample systems, so we know what to patch.

Watch for our patches to BASIC ver 9, to add SUB\$, SORT\$, AND PLOT.

H H H Enterprises
Box 493, Laurel, Md.
20810 301-953-1155

JPC PRODUCTS FOR

6800 COMPUTERS

SWTPC and MSI

AD-16 DATA ACQUISITION - 69.95

- **16 CHANNEL** precision analog input board.
- **VERSATILE** - supports individual channel programmable gain.
- **ACCURATE** - 0.39% resolution with less than 0.70% total conversion error.
- **FAST** - more than 3300 samples per second.
- **SOFTWARE** - included with documentation.

TC-3 CASSETTE INTERFACE - 49.95

- **FAST** - 4800 Baud Loads 4K in 8 Seconds!
- **RELIABLE** - Error Rate Less Than 1 in 10⁶ BYTES.
- **CONVENIENT** - Plugs Directly Into The Motherboard.
- **PLUS** - Read and Write Kansas City Standard Format at 300 Baud.

CFM/3 SOFTWARE - 19.95

- **CASSETTE OPERATING SYSTEM** for the TC-3 cassette interface. 2K memory required.
- **FILE MANAGER** supports named files, load, save, run, find, list, move, dir., etc.
- **BASIC, ASSEMBLER and EDITOR** can now support named files through the file manager.
- **OPTIONAL CFM/3 on cassette** - 6.95 additional.

etc.

- **MX-6** - main board extender - \$19.95
- **BT-9** - bus terminator - eliminate bus noise - \$9.95

"Designed By Professionals For Outstanding Performance"



P.O. BOX 5615
ALBUQUERQUE, N.M. 87185

(505) 291-4623
ADD \$2.00 PER ORDER
FOR SHIPPING & HANDLING

Software Source BooksTM

Combining detailed descriptions with complete source listings, these books explain the internal operations and algorithms used in Hemenway Associates's popular systems software.

How much would such a complete software resource cost? If you've seen the PAPERBYTE books by Jack Hemenway and Robert Grappel you know how inexpensive they can be. And now you can have the companion volumes to the RA6800ML macro assembler and LINK68 linking loader books.

Remember, these are not just books; they are SoftwareSourceBooks ---- complete Software resources! Order them today; VISA and MasterCard accepted.

TM CP/68 OPERATING SYSTEM (\$34.95)

- * PIP Peripheral Interchange
- * Program transfers data between physical devices
- * Wildcard Filenames and Extensions
- * Relocatable anywhere in Memory
- * Extended Instruction set includes 6809-type instructions (PSHX, PULX, etc)
- * Device-independent I/O
- * Random and Sequential Files
- * Fits in less than 8K
- * Chaining and overlaying
- * Single Supervisor Call furnishes all DOS services
- * Easily interfaced to new devices and peripherals
- * Dynamic file allocation

TM STRUctured Basic Language (STRUBAL+) COMPILER for both business and scientific uses (\$49.95)

- * Variable precision from 4 to 14 digits
- * Structured Programming forms
- * Produces Relocatable and linkable code
- * COMMON and DUMMY sections
- * Extensibility
- * String Handling
- * Full scientific package
- * Data structures with mixed data types

XA6809 Macro Linking Cross Assembler (\$24.95)

- * Runs on any M6800
- * Full Macro facilities
- * COMMON section for the production of ROMable code
- * Conditional Assembly
- * Generates linkable and relocatable code
- * Sorted Symbol table listing
- * Hash-coded Symbol table for speed

=====

Hemenway Associates Inc. 101 Tremont St. Boston MA 02108

Name	Title	Company
Street	City	State Zip

() Check enclosed in the amount of \$.....

(.) Bill VISA () Bill MasterCard

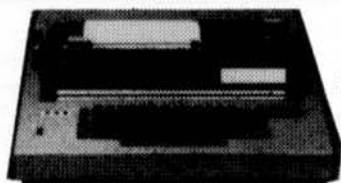
Card No..... Exp. Date.....

Please send the following books:

Add \$0.75 per book to cover postage and handling

SURPLUS ELECTRONICS

ASCII



ASCII

**WITH FLEX DRIVERS[®]
IBM SELECTRIC
BASED I/O TERMINAL
WITH ASCII CONVERSION
INSTALLED \$645.00**

- Tape Drives • Cable
- Cassette Drives • Wire
- Power Supplies 12V15A, 12V25A, 5V35A Others, • Displays
- Cabinets • XFMRs • Heat Sinks • Printers • Components

Many other items

Write for free catalog

WORLDWIDE ELECT. INC.

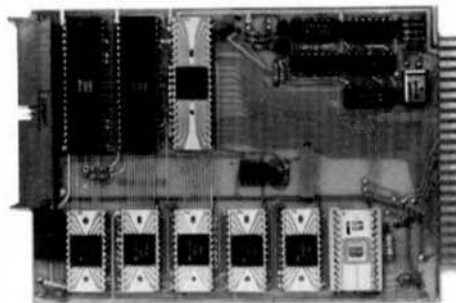
130 Northeastern Blvd.

Nashua, NH 03060

Phone orders accepted using VISA

or MC. Toll Free 1-800-258-1036

In N.H. 603-889-7661



SINGLE BOARD COMPUTER \$99.50*

with 6800 MPU, 6850 serial I/O, 2 6820 parallel I/O (32 lines), 512 RAM, socket for 2708, 2716, EPROM. Interface modules for industrial control, data acquisition, lab instrumentation, on 44 pin 4½"x6½" PCB's. RAM, ROM, CMOS RAM/battery, A/D, D/A, Driver/Sensor, Serial I/O, Parallel I/O, Counter/Timer, IEEE 488 GPIB, floppy controller.

*OEM (500 piece) price



WINTER

Corp.

902 N. 9th Street

Lafayette, IN 47904

Phone (317) 742-6802



**FINALLY, A
TELEPHONE
WITH BYTE!**

6800 AUTOMATIC TELEPHONE DIALER PROGRAM \$9.95 postpaid

Have your 6800 system dial your phone • Uses only 5 external components • Stores 650 variable length phone numbers • Operates in less than 1K bytes of memory

Includes: Paper tape in Mikbug[®] format and object code • Circuit diagram and instructions • Instructions for adapting to other 6800 systems

6800 TELEPHONE ANSWERING DEVICE PROGRAM \$4.95 postpaid

Have your 6800 system answer your phone and record messages automatically. Compatible with any 6800 system.

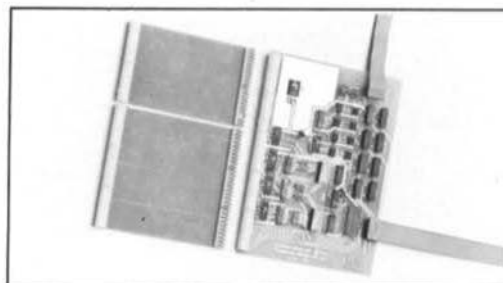
Includes: Assembly listing and object code • Circuit diagram and instructions

Write to: SOFTWARE EXCHANGE

2681 PETERBORO

W. BLOOMFIELD, MICH. 48033

Mikbug[®] is a registered trademark of Motorola Inc.



6800 OWNERS

At last a real world fully addressable SS-50 control interface. Control robots, appliances, organs, solar devices, etc. Applications limited only by your imagination. Easy to use with machine language as well as basic. Fully buffered board plugs directly onto mother board and responds to any address defined by user. 8 fast relays latch data while 8 opto-isolators allow handshaking capacity.

Kit \$98.00

Assembled and tested \$125.00

EXTENDER BOARDS

Extend both the 30 and 50 pin buses in SWTP 6800.

Both for \$19.95.

Visa & Master Charge • Ariz. Res. add 5% Sales Tax

WRITE FOR DETAILS

TRANSITION ENTERPRISES INC.

Star Route, Box 241, Buckeye, AZ 85326

SUPER SOFTWARE!

MICROWARE 6800 SOFTWARE IS INNOVATION AND PERFORMANCE

[NEW] LISP Interpreter

The programming language LISP offers exciting new possibilities for microcomputer applications. A highly interactive interpreter that uses list-type data structures which are simultaneously data and executable instructions. LISP features an unusual structured, recursive function-oriented syntax. Widely used for processing, artificial intelligence, education, simulation and computer-aided design. 6800 LISP requires a minimum of 12K RAM.
Price: \$75.00

A/BASIC Compiler

The ever-growing A/BASIC family is threatening old-fashioned assembly language programming in a big way. This BASIC compiler generates pure, fast, efficient 6800 machine language from easy to write BASIC source programs. Uses ultra-fast integer math, extended string functions, boolean operators and real-time operations. Output is ROMable and RUNS WITH UT ANY RUN-TIME PACKAGE. Disk version have disk I/O statements and require 12K memory and host DOS. Cassette version runs in 8K and requires RT/ 8 operating system.
Price: Disk Extended Version 2.1 \$150.00
Cassette Version 1.0 \$65.00

[NEW] A/BASIC Source Generator

An "add-on" option for A/BASIC Compiler disk versions that adds an extra third pass which generates a full assembly-language output listing AND assembly language source file. Uses original BASIC names and inserts BASIC source lines as comments. SSB and SWTPC Miniflex version available.
Price: \$50.00

[NEW] A/BASIC Interpreter

Here it is—a super-fast A/BASIC interpreter that is source-compatible with our A/BASIC compiler! Now you can interactively edit, execute and debug A/BASIC programs with the ease of an interpreter—then compile to super efficient machine language. Also a superb stand-alone applications and control-oriented interpreter. Requires 8K RAM. The cassette version is perfect for Motorola D2 Kits.
Price: \$75.00

RT/68 Real Time Operating System

MIKBUG—compatible ROM that combines an improved monitor/debugger with a powerful multitasking real-time operating system. Supports up to 16 concurrent tasks at 8 priority levels plus real time clock and interrupt control. Thousands in use since 1976 handling all types of applications. Available on 830 (MIKBUG-type) or 2708 (EPROM-type) ROM. Manual is a classic on 6800 real-time applications and contains a full source program listing.
Price: RT88MX (6830) \$35.00
RT88MXP (2708) \$55.00

6800 CHESS

A challenging chess program for the 6800. Two selectable difficulty levels. Displays formatted chess board on standard terminals. Requires 8K memory. Machine language with A/BASIC source listing.
Price: \$50.00

ELIZA

6800 version of the famous MIT artificial intelligence program. The computer assumes the role of a psychoanalyst and you are the patient. This unusual program is unique because the dialog with the computer is in unstructured plain English. An impressive demonstration program.
Price: \$50.00

Our software is available for most popular 6800 systems on cassette or diskette unless otherwise noted. Disk versions available on S.S.B., SWTPC, or Motorola MDOs. Please specify which you require. Phone orders are welcomed. We accept MASTERCARD and VISA. We try to ship orders within 24 hours of receipt. Please call or write if you require additional information or our free catalog. Microware software is available for OEM and custom applications.

MICROWARE
SYSTEMS CORPORATION

P.O. BOX 4885
DES MOINES, IA 50304
(313) 285-8121

'68' MICRO JOURNAL

- ★ The only ALL 6800 Computer Magazine.
- ★ More 6800 material than all the others combined:

MAGAZINE COMPARISON

(2 years)

Monthly Averages

6800 Articles

KB	BYTE	CC	DOBB'S	TOTAL PAGES
7.8	6.4	2.7	2.2	19.1 ea. mo.

Average cost for all four each month: \$5.88

(Based on advertised 1-year subscription price)

'68' cost per month: \$1.21

That's Right! Much, Much More

for About

1/5 the Cost!

EFFECTIVE SEPT. 1, 1979

1-Year \$14.50 2 Years \$26.00 3 Years \$36.50

OK, PLEASE ENTER MY SUBSCRIPTION

Bill My: Master Charge ☐ — VISA ☐

Card # _____ Exp. Date _____

For ☐ 1-Year ☐ 2 Years ☐ 3 Years

Enclosed: \$ _____

Name _____

Street _____

City _____ State _____ Zip _____

My Computer Is: _____

68 MICRO JOURNAL

3018 Hamill Road

HIXSON, TN 37343

Foreign surface add \$9.50 per year.

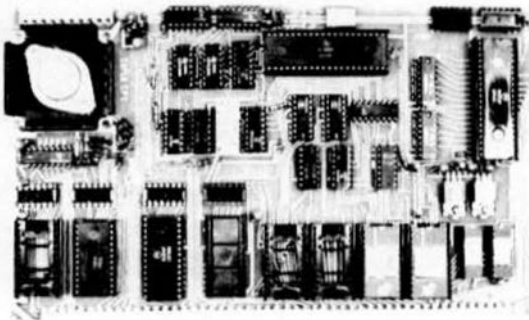
Foreign Air Mail add \$29.00 per year.



NOW INDUSTRIAL QUALITY AT LOW COST

FROM THOMAS INSTRUMENTATION

Industrial system boards are now available separately for OEM, prototyping or hobbyist applications. Shipped from stock, these are the same quality cards used in monitors and machine tool controls designed for GM, LTI, and General Electric. All cards are SS-50 buss compatible and are suitable for dedicated applications. The CPU card and the Video RAM Card may be combined on a TI backplane as a stand-alone micro — ideal for prototypes or hobbyists. ATTENTION OEM's: If you have a control data acquisition, monitoring, or other microprocessor application. Check with TI for more information about custom software design for the TI CPU or any other 6800 series system. TI also has non-SS-50 buss single board 6800 systems.



SS-50 SUPER CPU

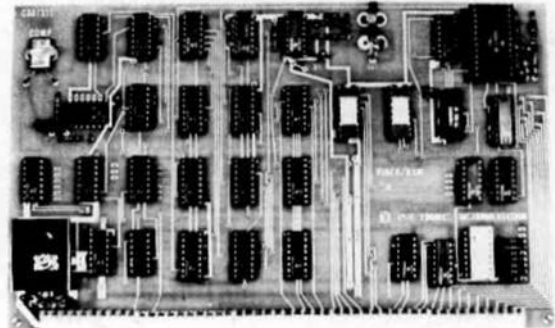
- SS-50 or stand alone computer
- 1K of RAM at \$A000 I/O on board at \$A400 (Relocatable)
- 2K Monitor (Mikbug compatible) in 2708 EPROM
- 2 8 bit parallel ports with 2 control bits and power
- RS-232 ACIA port, 2nd TTL ACIA optional
- 3 16 bit counter/timers (expandable to 6 add 2nd 6840)
- 128 byte RAM at 0000 is jumper selectable
- Battery back-up for 32 bytes of RAM
- Plug back to back with Video RAM for Stand alone micro or customized smart terminal

ASSEMBLED \$195.00
CARD AND DOCUMENTATION \$49.00

SS-50 VIDEO RAM

- Fully synchronous operation — No jitter
- 7 by 9 Characters Programmable reverse video
- Full 128 Character ASCII set
- 1K of memory can be mapped to any 1K boundary
- Full documentation includes software (Replaces OUTEE)

ASSEMBLED \$149.00
CARD, CRYSTAL and DOCUMENTATION \$39.00



TI SS-50 Wire-Wrap Card	24.00
TI SS-50 Parallel I/O Card	95.00
Card only	35.00
GIMIX 16K Static RAM w/Soft addressing	359.00
GIMIX 16 RAM without Soft addressing	290.00
3, 4, 7 SLOT Backplanes (per slot)	4.00

TI cards available from stock

THOMAS INSTRUMENTATION

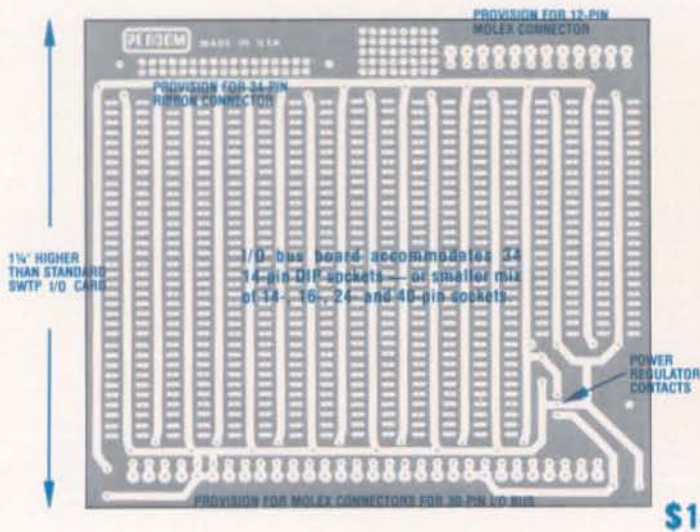
2709 Dune Drive, Avalon, N.J. 08202
Phone (609) 967-4280



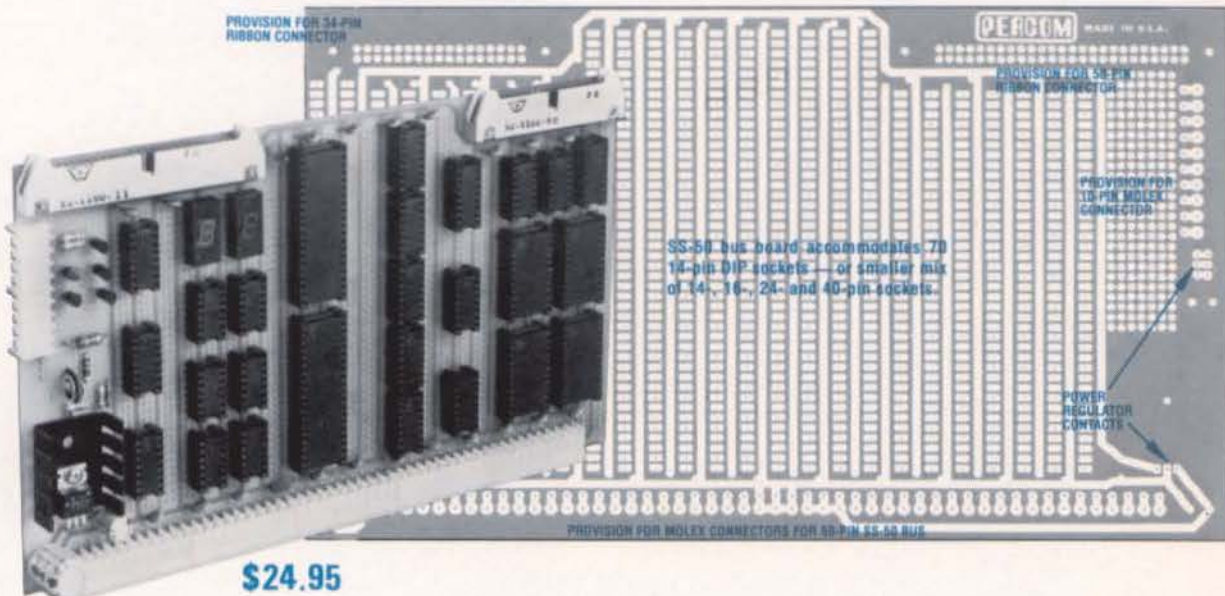
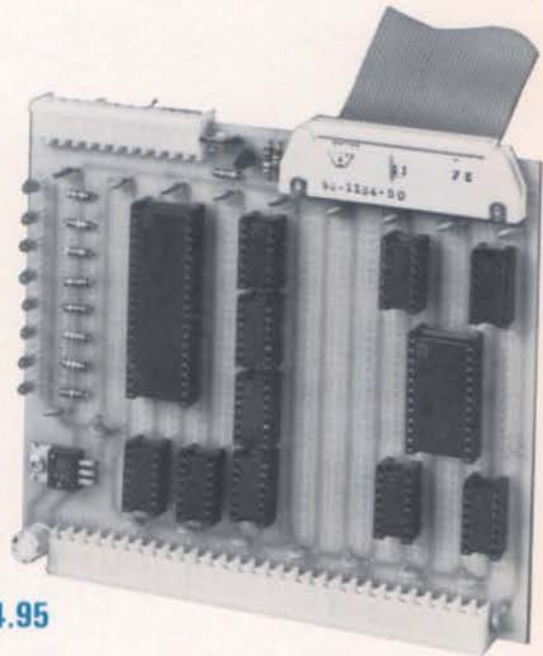
DEALERS FOR GIMIX SWTPC SSB

CALL FOR DEALER, OEM. AND QUANTITY PRICES

Full Feature Prototyping Boards for Your 6800/6809 μ C...from Percom



\$14.95



\$24.95

- Boards accommodate 14-, 16-, 24- and 40-pin DIP sockets.
- Top edge and side edge connectors are easy to interconnect to, provide for more accessible test points.
- Use either wire wrap, wiring pencil or solder wiring.

- Interdigitated power conductors simplify chip power connections.
- Contact holes for distributed capacitor bypassing.
- Printed wiring is 2-oz copper with reflowed tin-lead plating that wets quickly for easy soldering.
- Substrate is FR4-G10 epoxy-glass.

PERCOM

PERCOM DATA COMPANY, INC.
211 N. KIRBY • GARLAND, TEXAS 75042
(214) 272-3421

Percom "peripherals for personal computing"

To place an order or request additional literature call toll-free 1-800-527-1592. For technical information call (214) 272-3421. Orders may be paid by check, money order, CDD or charged to a VISA or Master Charge account. Texas residents must add 5% sales tax.

PRICES AND SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

SMOKE SIGNAL BROADCASTING PRESENTS...

THE SMOKE WRITER (VDB-1)

The SSB SMOKE WRITER incorporates the latest advances in electronic technology to bring you and the SS-50 bus a truly unique video display board. The SMOKE WRITER uses the MC6845 CRT Controller chip and provides total control over the display format.

IT'S NEW

*The standard features of
the SMOKE WRITER are:*

\$349.00

- 80 x 24 display with 32 graphic characters. Optional character generator ROM with 128 ASCII characters plus 128 graphic characters.
- Upper and lower case characters with lower case descenders.
- Programmable character set, a total of 128 characters in a 2K EPROM; a 256 character 4K EPROM is optional.
- 1K EPROM for Software drivers.
- Reduced intensity or reversed video
- Programmable display rate (10 to 5000 character per second) equivalent to 100 to 50K baud.
- Protected fields.
- Addressable Cursor.
- 2K video display RAM accessible by the CPU as standard RAM Memory.
- 128 Bytes of Scratch pad RAM.

If you have a need for a fast and dependable video display board, Smoke Signal Broadcasting has what you are looking for. The SMOKE WRITER is right at home when used with a cursor based editor or in a business program that needs protected fields.

SMOKE SIGNAL



BROADCASTING

31336 Via Colinas, Westlake Village, CA 91361, (213) 889-9340

For your SWTP 6800 Computer . . .

PERCOM's™ FLOPPY DISK SYSTEM the LFD-400

Ready to plug in and run the moment you receive it. Nothing else to buy, no extra memory. No "booting" with PerCom MINIDOS-PLUSX™, the remarkable disk operating system on EPROM. Expandable to either two or three drives. Outstanding operating, utility and application programs.



To order
or request
literature
call PerCom
toll-free
1-800-527-1592.

only
\$599⁹⁵

fully assembled and tested
shipping paid

PERCOM™

PERCOM DATA COMPANY, INC.
211 N. Kirby Garland, TX 75042
(214) 272-3421

For the low \$599.95 price, you not only get the disk drive, drive power supply, SS-50 bus controller/interface card, and MINIDOS-PLUSX™, you also receive:

- an attractive metal enclosure • a fully assembled and tested interconnecting cable • a 70-page instruction manual that includes operating instructions, schematics, service procedures and a complete listing of MINIDOS™ • technical memo updates — helpful hints which supplement the manual instructions • a 90-day limited warranty.

SOFTWARE FOR THE LFD-400 SYSTEM

Disk operating and file management systems

INDEX™ The most advanced disk operating and file management system available for the 6800. Interrupt Driven EXecutive operating system features file-and-device-independent, queue-buffered characterstream I/O. Linked-file disk architecture, with automatic file creation and allocation for ASCII and binary files, supports sequential and semi-random access disk files. Multi-level file name directory. Includes name, extension, version, protection and date. Requires 8K RAM at \$A000. Diskette includes numerous utilities . . . \$99.95

BASIC Interpreters and Compilers

SUPER BASIC A 10K extended disk BASIC Interpreter for the 6800. Faster than SWTP BASIC. Handles data files. Programs may be prepared using a text editor described below . . . \$49.95
BASIC BANDAID™ Turn SWTP 8K BASIC into a random access data file disk BASIC. Includes many speed improvements, and program disk CHAINING . . . \$17.95
STRUBAL +™ A STRuctured BASIC Language compiler for the professional programmer. 14-digit floating point, strings, scientific functions, 2-dimensional arrays. Requires 20K RAM and Linkage Editor (see below). Use of the following text editors to prepare programs. Complete with RUN-TIME and FLOATING POINT packages \$249.95

Text Editors and Processors

EDIT68 Hemenway Associates' powerful disk-based text editor. May be used to create programs and data files. Supports MACROS which perform complex, repetitive editing functions. Permits text files larger than available RAM to be created and edited . . . \$39.95
TOUCHUP™ Modifies TSC's Text Editor and Text Processor for PerCom disk operation. ROLL function permits text files larger than available RAM to be created and edited. Supplied on diskette complete with source listing . . . \$17.95

Assemblers

PerCom 6800 SYMBOLIC ASSEMBLER Specify assembly options at time of assembly with this symbolic assembler. Source listing on diskette . . . \$29.95
MACRO-RELOCATING ASSEMBLER Hemenway Associates' assembler for the programming professional. Generates relocatable linking object code. Supports MACROS. Permits conditional assembly . . . \$79.95
LINKAGE EDITOR — for STRUBAL +™ and the MACRO-Relocating assembler . . . \$49.95
CROSS REFERENCE Utility program that produces a cross-reference listing of an input source listing file . . . \$29.95

Business Applications

GENERAL LEDGER SYSTEM Accommodates up to 250 accounts. Financial information immediately available — no sorting required. Audit trail information permits tracking from GL record data back to source document. User defines account numbers . . . \$199.95
FULL FUNCTION MAILING LIST 700 addresses per diskette. Powerful search, sort, create and update capability . . . \$99.95
PERCOM FINDER™ General purpose information retrieval system and data base manager . . . \$99.95

™ trademark of PERCOM Data Company, Inc.

™ trademark of Hemenway Associates Company.

Now! The LFD-800 and LFD-1000. Add one, two or three LFD-800 drives and store 200K bytes per drive on-line. Add one or two (dual-drive) LFD-1000 units and store 800K bytes per unit on-line. Complete with interface/controller, DOS, cable & manuals. **Two-drive systems:** LFD-800 — \$1549; LFD-1000 — \$2495.

PERCOM "peripherals for personal computing"